ENGINEERING NEWS-RECORD

Howson heads ASCE—His small firm is big time p. 64

A McGRAW-HILL PUBLICATION

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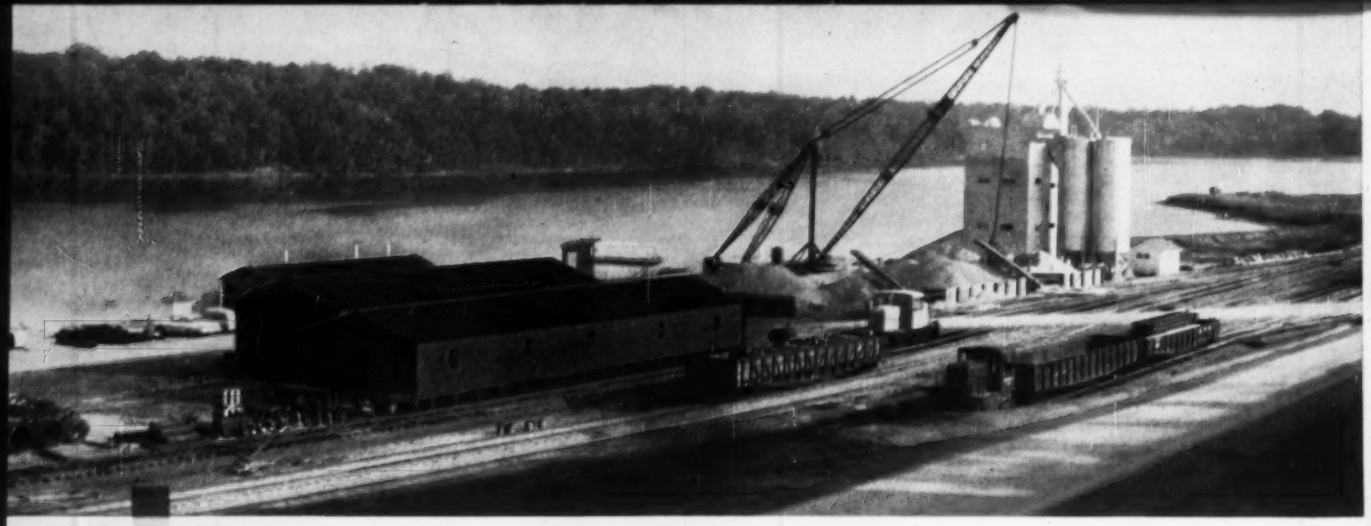


Of the 88 Armco Steel Buildings at the new Allen Steam Plant of the Duke Power Company, nearly half of them are at their third site. An equal number are at their second location.

These Armco Steel Buildings are at Their **Third Power Plant Construction Site**

Erected three times at different sites . . . and ready to go again!

That's the record of 37 Armco Steel Buildings used by the Duke Power Company to house workers and machines during construction projects at their various power plants in the Carolinas.

Formerly, wooden buildings were erected at construction sites and later abandoned because relocation was too costly. Then, in 1950, the Duke Power Company erected 37 Armco Buildings—bunkhouses, family-type houses, foremen's offices and tool rooms—during expansion of their Buck Steam Plant. Upon completion of work here, the buildings were dismantled and re-erected for construction crews at the Dan River Plant site.

Recently, ground was broken for the new Allen Steam Plant. The Armco Buildings, already used at two previous construction sites, were again dismantled and re-erected—*their third location.*

* * *

Armco Steel Buildings are available in more than 5,000 sizes, in clear-span widths from 5'-4" to 100'. Offering high quality at lower cost, they are widely used by contractors, engineers, industries, municipalities and highway departments. Armco Drainage & Metal Products, Inc., 4177 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

These 16- by 60-foot Armco Buildings in the foreground have been dismantled, moved and re-erected twice. First time they were moved 90 miles; the second time it was 140 miles.

One of the many Armco Steel Buildings used by the Duke Power Company as a family-type house. The 24- by 32-foot structure is at its third location.

For more information and prices on Armco Steel Buildings, Call Western Union and ask for Operator 25

Armco Construction Products

ARMCO®

NEW Allis-Chalmers TS-160

7 yd struck
9.5 yd heaped
155 horsepower
5 speeds to 25.4 mph
12-ton payload

Measure these advantages for a wide range of construction jobs . . .

22 hp per struck yard—Extra lugging ability for tough pulls, fast loading. Teams up with big equipment or works alone, handles a wide range of utility jobs, travels at speeds up to 25.4 mph.

Turns non-stop in less than 25 ft with 90-degree hydraulic steering . . . easy maneuverability in narrow cuts, faster cycles without reversing in tight turn-arounds.

Moves quickly from job to job . . . when required, transport wheels are available to meet legal load limits for highway travel.

Ask your nearby Allis-Chalmers construction machinery dealer for a demonstration now!

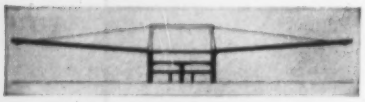
ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WIS.

ALLIS-CHALMERS

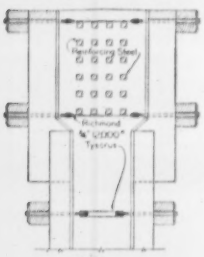
Engineering in Action

anchor walls

Richmond Tyscrus perform double function in unique hangar construction



The top walls of this air line hangar building at New York International Airport – built by Corbetta Construction Company – act as anchors for the steel cables which will support cantilever roofs over hangars on both sides. Richmond Tyscrus, at 4′ x 2′ spacing, hold the forms in place for a full-height continuous pour of these 12″ x 30′ x 100′ anchor walls. In addition, the Tyscrus support the reinforcing steel cages of 24 1⅜″ square bars, thermit-welded to provide 100 ft. long continuous reinforcing in the top beams of each wall. Weight of this reinforcement runs around 240 lbs. per foot.



TOP SECTION, ANCHOR WALL

An ingenious system of pouring pockets in the forms permitted easy access to the Tys for installing Tylags on the closing side. Assembly and stripping of forms was fast; Richmond 2-strut, ¾″ Tyscrus (published safe load 12,000 lbs., ultimate strength 20,145 lbs.) have self-cleaning threaded connections.

The new Richmond Handbook describes the full line of Richmond-engineered tying devices. Write to: RICHMOND SCREW ANCHOR COMPANY, INC., 816 Liberty Avenue, Brooklyn 8, N. Y. or 315 So. 4th St., St. Joseph, Mo.

ENGINEERING NEWS-RECORD

EIGHTY-THIRD YEAR OF PUBLICATION

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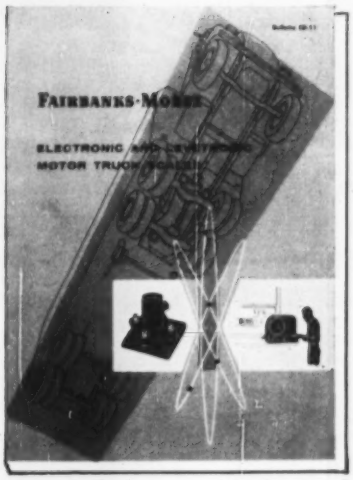
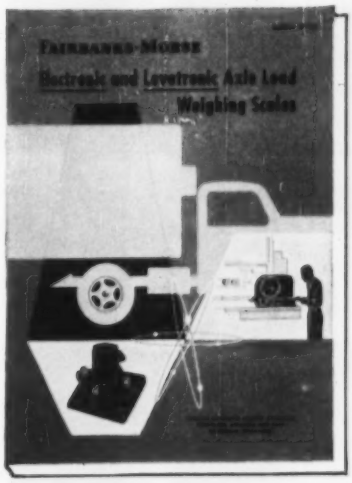
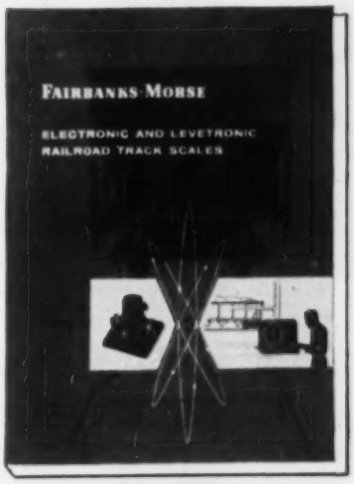
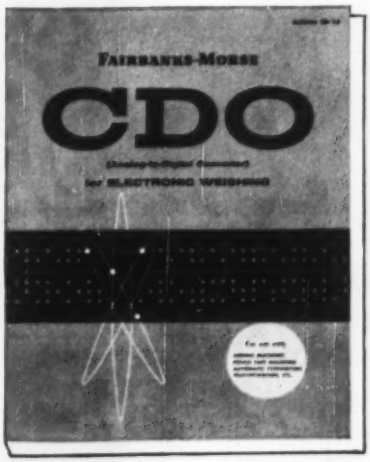






The story of Fairbanks-Morse Electronic Scales in seven volumes



Just off the press—seven new bulletins about Fairbanks-Morse electronic weighing and batching machinery. The covers pretty well identify themselves as illustrated above, except that you might not know that EPC is a completely automatic batching system that operates from punch cards . . . or that Batchetron is a slightly less automatic batcher with quick provision for manual preset of the cycle . . . or that CDO is a "read-out" instrument that will translate the weight message of any of the other six into the language "spoken" by automatic typewriters and automatic adding machines and automatic tape punches.

Write today for one or more of the new bulletins on Fairbanks-Morse electronic weighing and batching. Fairbanks, Morse & Co., Scale Division, Dept. ENR-1024, 600 South Michigan Avenue, Chicago 5, Illinois.

FAIRBANKS-MORSE

a name worth remembering when you want the BEST

SCALES • PUMPS • DIESEL LOCOMOTIVES AND ENGINES • ELECTRICAL MACHINERY • RAIL CARS • HOME WATER SERVICE EQUIPMENT • MAGNETOS

do you have a standard color? If so— we can help you!

If you are one of the vast number of manufacturers who relies on a standard color for quick identity of your products, we would like you to consider the advantages of using Tousey Duracote or Speed Duracote.

- Duracote finishes are sun-resistant; field tests show that even after months under the toughest weather conditions they retain their high gloss and show no appreciable fade.
- Duracote finishes are perfectly matched to manufacturers' specifications, order after order.
- Duracote finishes are tough; their mar-proof surfaces absorb punishment with a minimum of cracking or flaking.
- Duracote finishes are made by Tousey Varnish Company, whose 72 years' experience has been in the field of weather resistant finishes.

For the best in color protection, choose Tousey Duracote, or Speed Duracote.

B.F.Goodrich

These tires handle the biggest jobs . . . give more traction, more wear, more retreads!

MONTH in and month out, in all kinds of weather, Julius Porath and Son Company, Detroit, goes about the rugged job of building roads in southeastern Michigan. 105 vehicles—including trucks, cranes, dozers, graders—work 8 to 10 hours a day, 5 to 6 days a week.

Equipment rolls on soft ground, over rock-strewn roads, often over no roads at all. Unnecessary tire failures could tie up production—skyrocket costs. But not for Porath. They use B.F.Goodrich off-the-road tires, report they are "the best tires for this type of work."

One reason is the B.F.Goodrich FLEX-RITE NYLON cord body. It withstands double the impact of ordinary cord materials, resists heat blowouts and flex breaks. The FLEX-RITE NYLON body outwears even the extra-thick tread, can still be retreaded *again and again!*

B.F.Goodrich builds off-the-road tires with extra-thick treads designed to bite into the soil for maximum traction. No matter what kind of construction work you do, there's a B.F.Goodrich tire to make your work go faster, and save you money.

Your B.F.Goodrich dealer has a complete line of tires (left), and he offers expert, on-the-job tire service. See him today or write: *B.F.Goodrich Tire Company, A Division of The B.F.Goodrich Company, Akron 18, Ohio.*

Specify B.F.Goodrich tires when ordering new equipment

THERE'S A B.F.GOODRICH TIRE FOR EVERY CONSTRUCTION JOB

UNIVERSAL | ROCK LOGGER | SUPER TRACTION | TRACTION EARTH MOVER | ROCK SERVICE

B.F.Goodrich
FIRST IN RUBBER

Your B.F.Goodrich dealer is listed under Tires in the Yellow Pages of your phone book

POWER VANE

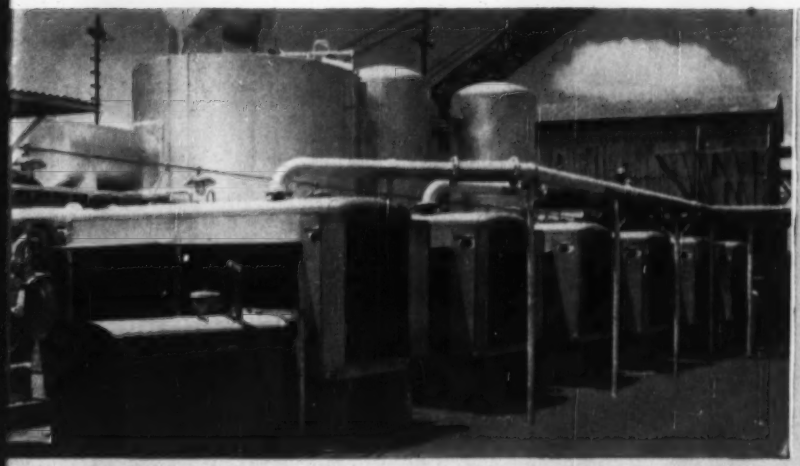
CP "POWER VANE" Rotaries are used under job conditions where there's no room for failure . . . in all climes . . . in all parts of the world . . . in deserts, high altitudes and at sea. CP "POWER VANE" Rotaries stand up—they can "take it" and still provide hour after hour of air power with a minimum of attention and upkeep. Let your CP equipment dealer give you complete information. *Chicago Pneumatic Tool Co., 8 East 44th St., N. Y. 17, N. Y.*

This Model 600 "POWER VANE" Rotary proved ideal for supplying air for the CP Trenchdrils on a pipeline construction job where portability over bad ground and unfailing operation when tilted up to 30° were essential.

in desert sands . . .

CP rotaries

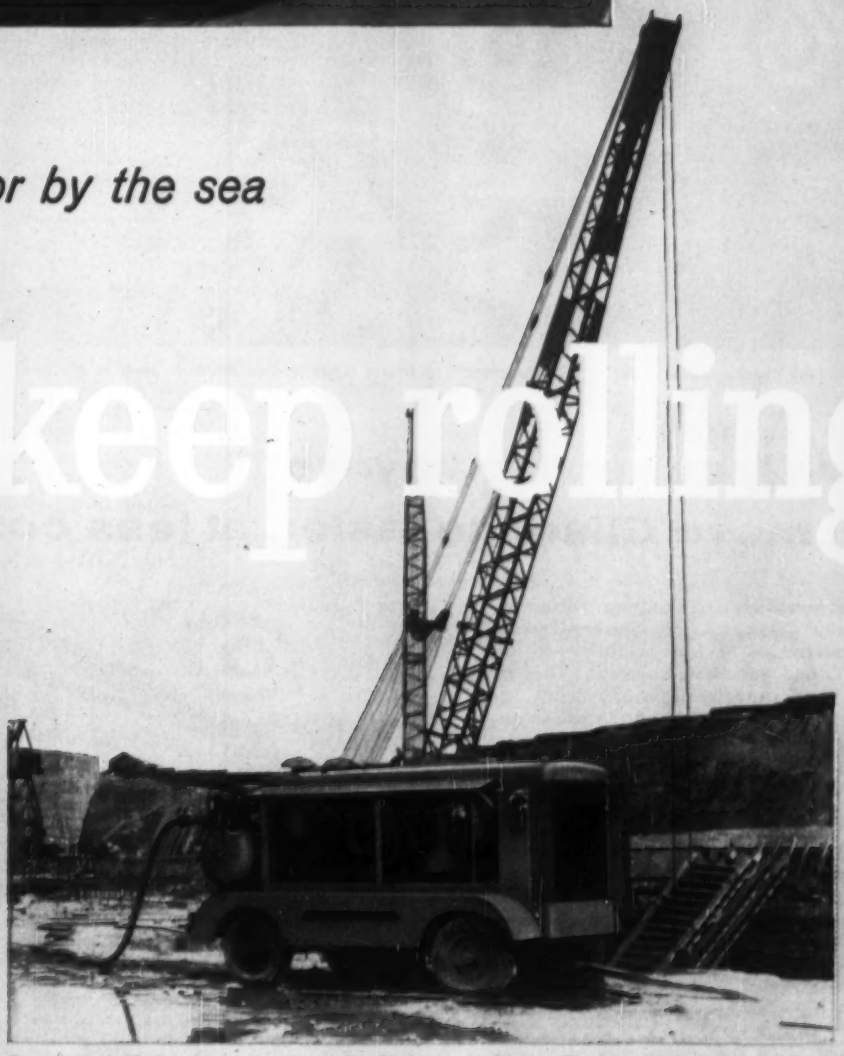
In the blistering heat of California desert, (temperatures up to 130°), this Model 125 "POWER VANE" Rotary does its job from dawn to dark.



At sea, this battery of Model 900 "POWER VANE" Rotaries serve aboard a barge used in off-shore operations in Venezuela. Service records under similar exacting conditions made CP units a natural selection.

...or by the sea

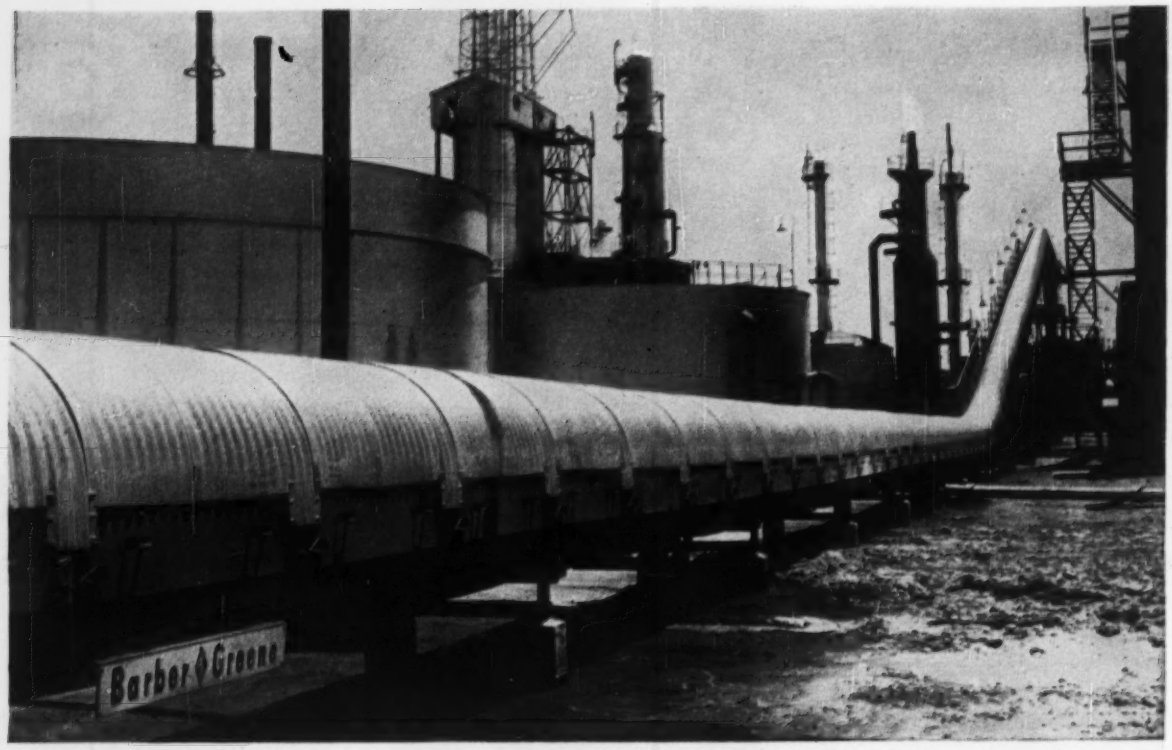
"keep rolling"



One of many CP Rotaries at the site of the St. Lawrence Seaway. They're operating all-year 'round, 24-hours a day even in sub-zero weather.

Chicago Pneumatic

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES • ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

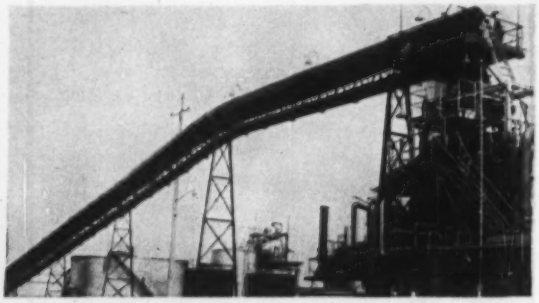


This 487-ft. Barber-Greene Conveyor, one of five at the new plant, carries wet Gilsonite from the filter plant to the melt tank.

Barber-Greene Conveyors move Gilsonite faster, at less cost

To cut costs and save time in handling Gilsonite, American Gilsonite Company uses Barber-Greene Standardized Conveyors—774 feet of them—at its new plant near Grand Junction, Colorado. This is typical of how these conveyors pay dividends in thousands of specialized applications. And this is why —more and more—Barber-Greene Conveyors are recognized as the most efficient, most economical way to handle all bulk materials.

Barber-Greene has put new meaning in belt conveyor economy. Built of standardized components, Barber-Greene Conveyors are delivered sooner and erected faster. They give top performance, yet require less engineering, and are more easily altered to meet changing or expanding requirements. Standardization also means readily available repair parts—usually from the stock of your local distributor.



When material from the filter plant is not being fed to the melt tank (above, right), it is stockpiled by a Barber-Greene Radial Stacker to permit the plant to operate when the mine is shut down.

57-15 PE

Barber-Greene BG

AURORA, ILLINOIS, U.S.A.

CONVEYORS...LOADERS...DITCHERS...ASPHALT PAVING EQUIPMENT

Reader Comment

Question of Semantics

SIR—In your report of the diamond jubilee convention of the New England Water Works Association (ENR Sept. 26, p. 27), a statement is made that the Chicago Central District Filtration Plant is based on a filter rate of 3.75 gpm.

The Central District Filtration Plant is rated at 960 mgd, based on a filter rate of 2 gpm and not at the 3.75 gpm rate as noted. It is true that we have designed the plant, hydraulically, so that it can be operated at 175% of the rated capacity, but the actual basis for design is at the 2 gpm rate.

GEORGE S. SALTER
Chief Filtration Engineer
Department of Public Works
Chicago, Ill.

(EDITOR'S NOTE: Our report attempted to make the point that water filtration plants today are being designed to operate at higher and higher filtration rates. Many plants so designed, Chicago's included, are, however, rated at 2 gpm per sq ft of filter area to conform to state regulatory agency requirements. A common operating level being designed today is 3 gpm per sq ft, which is why the Billerica, Mass., plant at 3.4 gpm, noted in the article, and the new Chicago plant are unusual.)

Check the Old Masters

SIR—This writer is concerned with the glossing-over given to the old master builders. The importance of technical library research on what may appear to be an insurmountable problem is usually neglected.

Picture a young civil engineer confronted with an apparently impossible problem. His approach to a solution is sincere but too often the solution is too complicated or too simple. And either of them may turn out to be needlessly expensive to construct.

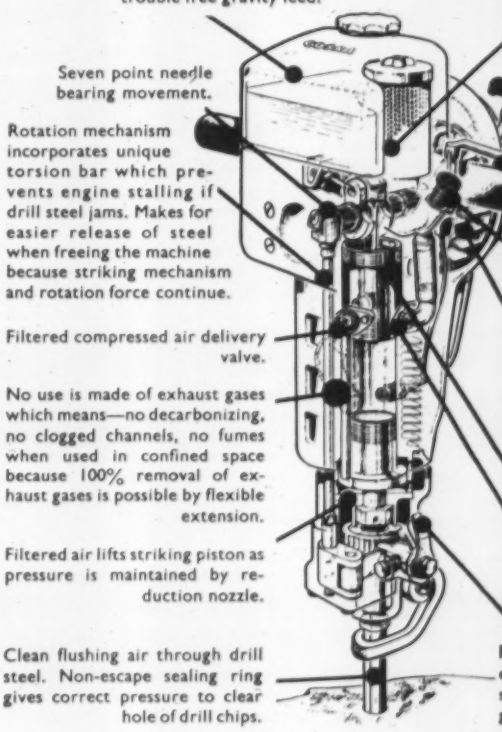
In terms of illustration, we can all learn from the recently publicized plans for the development of the 1,100 acre Overpeck Park in New Jersey (ENR Sept. 26, p. 26). To an engineer, a

Engineering News-Record welcomes expression of opinions from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance. Letters should be addressed Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

NEW COBRA

WORLD'S LIGHTEST MOTOR DRILL

After extensive field testing the new 100% self-contained motor drill/breaker from Atlas Copco is on the market. The COBRA is a versatile, portable tool weighing only 53 lbs, drilling to 13 ft at 26 ft per hour. The COBRA can be used at high altitudes up to 11,000 ft, and is specially designed for easy carrying. It is quickly converted to light breaker, and embodies all the outstanding features shown below, which make it the most up-to-date machine of its kind and one that has already proved its worth in many parts of the globe.


Non-return air inlet insures leakproof fuel tank. Constant fuel supply from trouble free gravity feed.
Air filter supplies clean air to both engine and compressor.
Seven point needle bearing movement.
Instant pull-type starting in any climate.
Rotation mechanism incorporates unique torsion bar which prevents engine stalling if drill steel jams. Makes for easier release of steel when freeing the machine because striking mechanism and rotation force continue.
Top throttle control gives full power in working position and returns to idling automatically when hand pressure released.
Single action mixture control and floatless carburettor ensure foolproof running even when operated upwards at 45°
Filtered compressed air delivery valve.
No use is made of exhaust gases which means—no decarbonizing, no clogged channels, no fumes when used in confined space because 100% removal of exhaust gases is possible by flexible extension.
Turbo type fan gives forced directional air cooling to all vital points. Rugged built-in flywheel magneto gives positive ignition under all conditions.
Built-in air compressor.
Filtered air lifts striking piston as pressure is maintained by reduction nozzle.
Filtered air through suction valve.
Clean flushing air through drill steel. Non-escape sealing ring gives correct pressure to clear hole of drill chips.
Free-wheeling lever (simple decompression immobilises striking piston—also disengages rotation mechanism).

See the Cobra in action. Write or phone for further information.
Sales and service depots from coast to coast

Atlas Copco

ATLAS COPCO EASTERN, P.O. Box 2568, Paterson 25, N.J. Phone Armory 4-3310

ATLAS COPCO CANADA, Montreal Airport, Quebec. Phone Melrose 1-5571

ATLAS COPCO PACIFIC, 930 Brittan Ave., San Carlos, Calif. Phone Lytel 1-0375

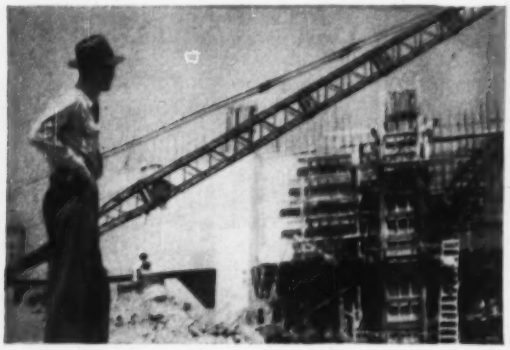
ATLAS COPCO MEXICANA, Apartado Postal 56, Torreón, Coahuila. Phone 39-07

oss/ae

LIBERTY MUTUAL

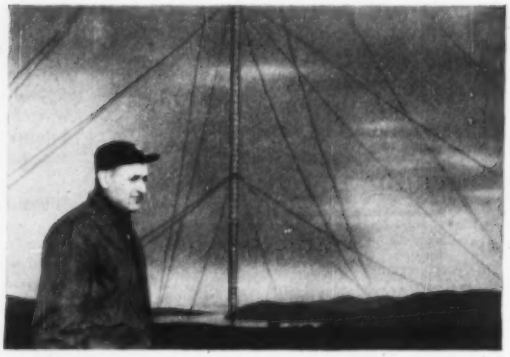
10 WAYS Liberty Mutual serves you better . . .

1 **Advance analysis:** Liberty Mutual's construction engineers scrutinize your blueprints, equipment, falsework design, materials handling, traffic plans, etc. Control measures are practical, down-to-earth.

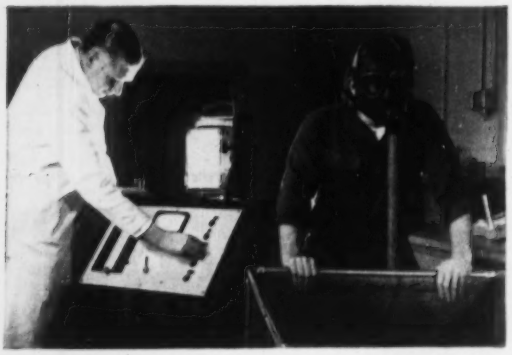


2 **Engineers on the job:** The Liberty Engineer reports to management on each work stage. He helps instruct workers, provides technical assistance on such problems as blasting, soil testing, and structural safety.

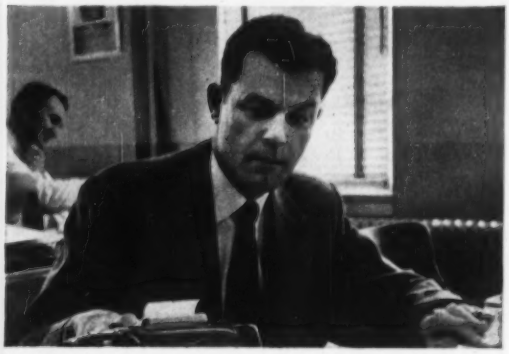
3 **Around the clock claims service:** Liberty has 1300 experienced claimsmen working out of 101 offices. They speed treatment of injured, investigate thoroughly, report promptly. Sometimes the claimsman lives on the job.



4 **Ability to follow your operations:** With offices throughout the United States, it's easy for Liberty to provide fast, experienced help on all jobs. Liberty has also provided insurance on many off-continent construction projects.



5 **Safety research:** Liberty has its own laboratory in which it studies overall construction safety, and solves specific problems encountered by individual contractors. Out of this have come many ideas for reducing construction accidents and costs.



6 **Speedy auditing service:** Liberty has its own auditors, specialists in the construction field, who provide fast auditing and assure proper allocation of payroll classification. They can save you money, and improve your position on competitive bids.

The Company that stands by you

and saves you money on all your construction insurance needs

7 **Unique medical program:** Liberty helps you set up a medical program on the job . . . gets medical care when a worker is hurt . . . has specialists who follow serious cases . . . provides rehabilitation centers for the badly injured.

8 **Direct dealing:** You deal direct with Liberty Mutual personnel — all full-time salaried employees of the company. This means you deal with your insurance company itself, not with a broker or middleman.

9 **Savings:** As a policyholder of Liberty Mutual, you share in the company's savings.* Through careful operating methods, substantial economies are produced. Dividends have exceeded $422,000,000 since 1912.
*All Liberty Mutual policies are non-assessable.

10 **Proved ability to lower your costs:** The chart above shows how one contractor lowered his cost 42% in 4 years through experience modification. Liberty Mutual can show you a large list of contractors whose insurance costs have been dramatically reduced.

LIBERTY MUTUAL — The number 1 writer of compensation insurance for 20 straight years.

If you'd like to see how your present insurance cost and service compare with what Liberty Mutual offers — clip and mail this coupon. A Liberty Mutual representative will call on you at your convenience.

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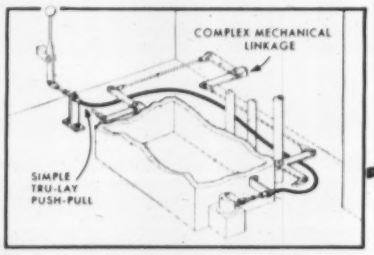
Advantages of Tru-Lay Push-Pull flexibility and simplicity are pictured below

Simplicity vs Complexity

Compare the TRU-LAY PUSH-PULL cable in illustration with the mechanical linkage. PUSH-PULLS are simple, have but one moving part, are noiseless and give lifetime service accuracy. Linkages are complex, made of many parts; they wear at many points. Their use brings increased backlash, lost accuracy and vibration rattles.



"Solid as a rod but flexible as a wire rope" is a good description of TRU-LAY PUSH-PULL REMOTE CONTROLS. This flexibility makes it possible to snake around obstructions . . . permits the ideal arrangement of all control elements . . . greatly simplifies installation of controls by reducing the number of working parts . . . damps out noise and vibration. Versatile, accurate, adaptable, rugged . . . they are the ideal remote controls for construction equipment.

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park presents no particular problems; the design is more normally the concern of the landscape architect and the town planner. In this case there was no useful site to build on. It consisted of 1,100 acres of salt water marsh, untouched for centuries.

When the writer, a civil engineer, was handed the assignment to "iron out" the engineering problems of the Overpeck site preparation, he turned to the Engineering Societies Library to find out how the old timers had handled swamp reclamation. As expected, the dust-laden books and reports detailed similar problems met and solved. Marsh reclamation by "enclosure" had been practiced in Holland in the 1200's; it had been practiced in our own Maryland in the 1800's. The "enclosure" technique was spelled out in words, drawings and plans; including most recent works of this nature. It can be seen, that thanks to engineers long gone, I had nothing to "iron out". There remained only the application of time-hallowed concepts to a site in New Jersey.

As further proof of my concern over the neglect of our technical predecessors, let me point out the furor caused when I first outlined my solution. The client was dubious, the boss was tickled but reserved. The county engineer thought it impractical; fellow consultants said they never heard of such a technique. Apparently, a little hurried collateral reading helped them too. They changed their minds, and came to agree that "perhaps the old Dutchmen really had something there".

Next time you're given a tough one, it might be wise to start with research. As the advertising men like to say, there's nothing new under the sun. The librarian is in a position to make life much easier for all of us.

EDWARD FORREST
New Brunswick, N. J.

CALENDAR

National Highway Conference for County Engineers and Officials, County and Local Roads Division, ARBA, French Lick-Sheraton Hotel, French Lick, Ind., Oct. 28-30.

Hydraulics Conference and Annual Pacific Northwest Meeting, American Geophysical Union, Washington State College, Pullman, Wash., Oct. 28-31.

Building Officials Conference of America, Inc., central west regional meeting, Chase Hotel, St. Louis, Mo., Oct. 31, Nov. 1-2.

American Concrete Institute, regional meeting, Benjamin Franklin Hotel, Seattle, Wash., Nov. 5-6.

American Society of Civil Engineers, Kansas City Section, regional highway conference, Continental Hotel, Kansas City, Mo., Nov. 7-8.

American Public Health Association, annual meeting, Cleveland, Ohio, Nov. 11-15.

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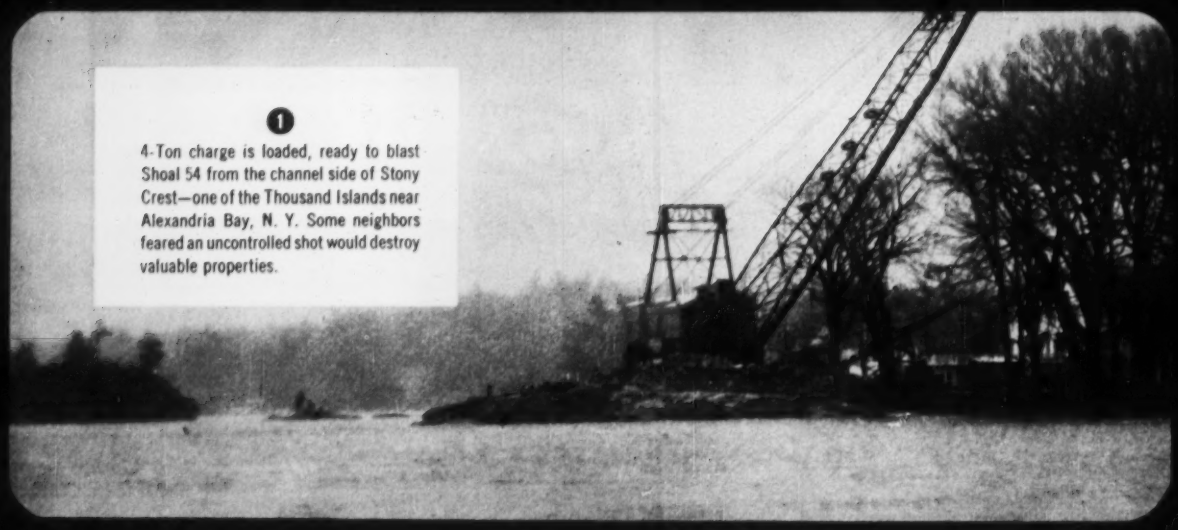
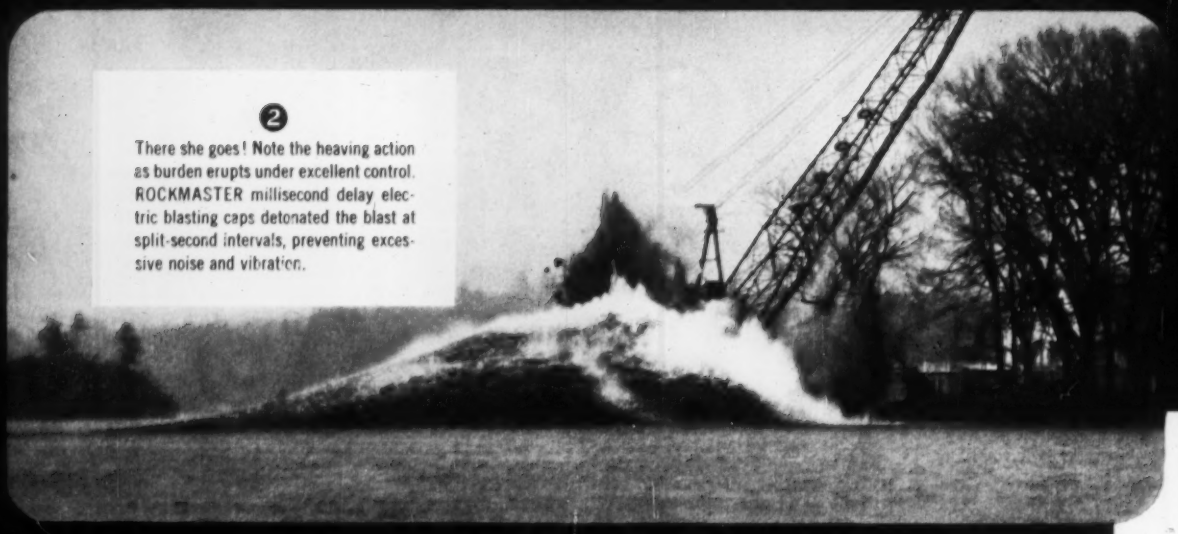


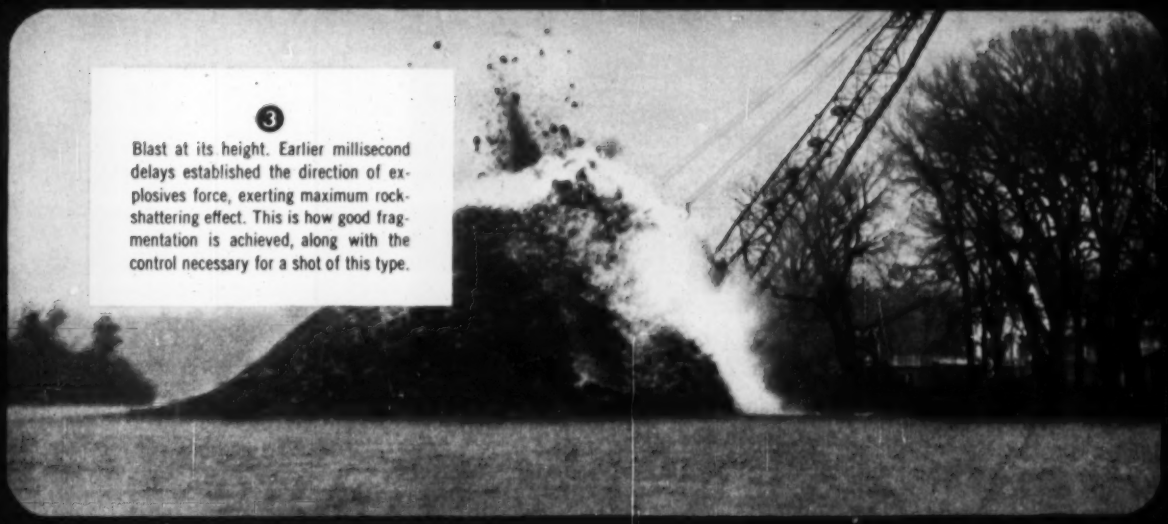
❶ 4-Ton charge is loaded, ready to blast Shoal 54 from the channel side of Stony Crest—one of the Thousand Islands near Alexandria Bay, N. Y. Some neighbors feared an uncontrolled shot would destroy valuable properties.



❷ There she goes! Note the heaving action as burden erupts under excellent control. ROCKMASTER millisecond delay electric blasting caps detonated the blast at split-second intervals, preventing excessive noise and vibration.

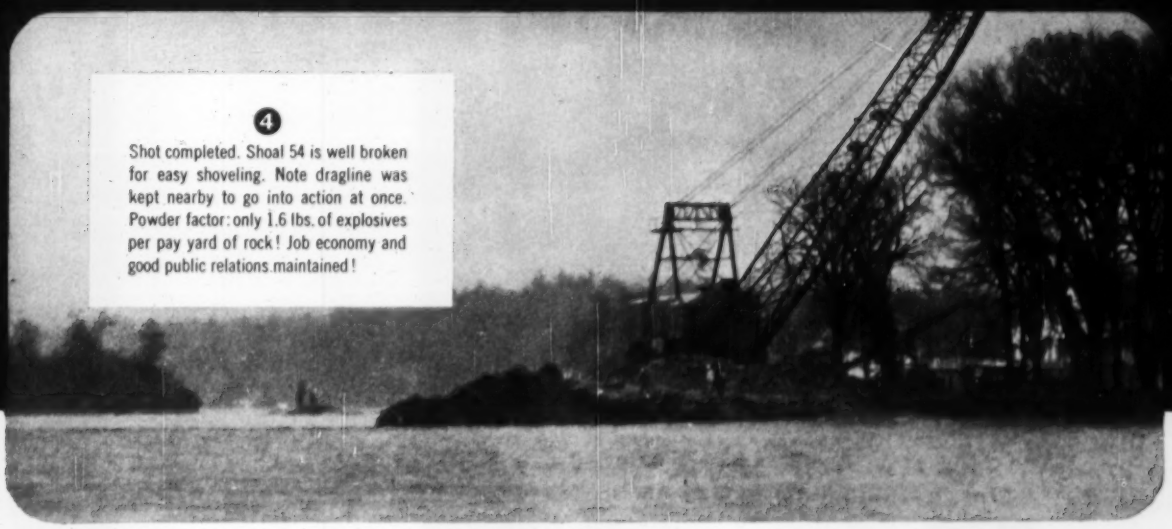
SHOAL FIFTY-FOUR IS NO MORE

Rockmaster blast pays off in pay-yards of rock..... with good public relations in the bargain!



❸

Blast at its height. Earlier millisecond delays established the direction of explosives force, exerting maximum rock-shattering effect. This is how good fragmentation is achieved, along with the control necessary for a shot of this type.



❹

Shot completed. Shoal 54 is well broken for easy shoveling. Note dragline was kept nearby to go into action at once. Powder factor: only 1.6 lbs. of explosives per pay yard of rock! Job economy and good public relations maintained!

Deepening the channel for the St. Lawrence Seaway involves blasting out shoals in the Thousand Islands—with swanky summer homes nearby. This calls for skillful shooting.

The blast illustrated here, handled by Tecon Corporation of Dallas, Texas, highlights the efficiency of the Atlas ROCKMASTER® System in producing economical dredging while maintaining good public relations.

Approximately 12,000 tons of rock were blasted to remove this portion of Shoal 54 from Stony Crest Island, Alexandria Bay. Drilling was done from land instead of barge. Four tons of Atlas Giant Gel were loaded in a vertical fan arrangement through flexible tubes. Despite three days required for loading, Atlas triple-wrapped cartridges remained in perfect condition.

Results . . . without troubles

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Every one of these cylinders is subjected to a rigorous hydrostatic test which places a stress of up to 25,000 psi in the steel. During the test every welded seam is carefully examined for leaks, and only those cylinders which are completely watertight are accepted. This is only one of the many quality control measures observed throughout the production of Lock Joint Concrete Pressure Pipe.

Can you guess approximately how many bodies of average priced automobiles could have been made from the steel cylinders required in the construction of the 254,500′-48″ section of the Saginaw-Midland water supply line? If you're stumped, the answer appears in the picture above.

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ENGINEERING NEWS-RECORD

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THE CONSTRUCTION WEEK

NSPE, SPUTNIK AND UNITY—Meeting in Bismarck, N. D., last week, the Board of Directors of the National Society of Professional Engineers forcefully opposed any "Sputnik-inspired crash program to train more engineers." NSPE believes the controlling factor in Russia's early launching of its earth satellite was priority in the assignment of money and emphasis, rather than any shortage of technical personnel in the U.S. Then NSPE heard from its Past-President Allison C. Neff, who heads a committee looking into the professional unity question. Mr. Neff had spent most of the week at the ASCE meeting in New York (p. 21) where he may have heard expressed the demand that NSPE get into the Engineers Joint Council along with all the other major engineering groups. His committee's report indicated generally that NSPE will be studying this and other unity proposals.

MOBILE MILITARY REACTOR PLANTS—The Atomic Energy Commission is looking for a compact military reactor system for military applications. Qualified industrial firms are being invited to submit proposals for preliminary studies of mobile nuclear power plants with power ratings up to 2,000 kw net electrical output. Several independent preliminary studies will be sponsored that may lead to development of nuclear plants with higher performance in the characteristics needed than are now being developed.

WRIGHT OPPOSES CAPITOL CHANGE—Interviewed last week in Washington, D. C., Frank Lloyd Wright went on record as being opposed to the proposed changes in the National Capitol (ENR Oct. 10, p. 23). The idea is "absolutely profane," he said. "They should leave it alone," he declared. "I'm sure they can't improve it." Mr. Wright also remarked that he had seen "a marked change for the better in the last five years," in the nation's architectural tastes. "Architecture is coming along fine," he said, "except for the AIA. The only thing wrong with architecture is the architects."

STORY TELLER NEEDED—Mindful of its own shortcomings in the matter of public relations, the Vermont State Highway Department is going to do something about it. According to Highway Commissioner William Poeter, three persons are now being interviewed for the post of public relations director for the department. "There are probably stories right under our noses that would increase public confidence in the department," Commissioner Poeter says. "We are well aware that an uninformed public is a dangerous thing." He adds that the person named to the post will have access to all departmental information and will sit in on meetings of the Highway Board. "There will be no restrictions. We don't want someone in this job to cover up."

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"Faster-from-Foster" service pays off in big savings!

As uses of pipe for piles increase, more and more contractors are calling on L. B. Foster Company for the best and fastest service available. These contractors know us as specialists in steel pipe for piling, in all diameters and wall thicknesses—spiralweld, electricweld, seamless, and lapweld.

On this river-span job we delivered 16-inch diameter Taylor-Forge Spiralweld foundation pipe (in 52 and 60-ft. lengths) as piling for bents of two bridges which span 135-ft. streams. While we are constantly supplying scores of small jobs every day, we'll also deliver all the material required for even the biggest jobs . . . to your job site, and . . . on schedule. No delays for you, no storage problems, more savings.

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Working from barges, Brennan Brothers of La Crosse, Wisconsin and Lansing, Iowa placed spiralweld foundation pipe in 8 feet of water, then had to drive through 40 ft. of Mississippi River sand, clay and mud bottom. Piling, supplied by L. B. Foster Co. was concrete capped, each measured 26 x 3 x 2 ft.

WASHINGTON OBSERVER

- **Bonus for interstate road system**
- **Construction progress payments unimpaired**
- **White House revitalizes lease-purchase**
- **New push for federal urban renewal**

● **Additional interstate highway allocations of 2,102 miles have been made to the states.** Relocation and shortening of routes approved in 1947 for the 40,000 mile system have made possible a "saving" of 1,102 miles. In addition, in the 1956 Highway Act, Congress provided a supplemental 1,000 miles.

It is entirely possible that the "saved" 1,102 miles will be eligible for 90% of federal financing, since it could be considered a part of the original 40,000 mile system. Under present law, however, the supplemental 1,000 miles added in 1956, however, can't receive 90-10 federal aid.

Some of the big mileages allocated out of the "saved" 1,102 miles are significant: a 431 mile stretch between Canton, Ohio, and Charlotte, N. C., which would be a new link to the financially hard-pressed West Virginia Turnpike; 143 miles from San Antonio to Corpus Christi, Tex.; 170 miles from Nashville to Mobile, Ala.

Out of the 1956 supplemental 1,000 miles, biggest allocation is 547 miles, for a road between Denver and Cover Fort, Utah.

● **Defense Department cutbacks on progress payments will not apply to any construction projects.**

The Army and Navy already ruled that construction contractors were entitled to progress pay as before. Now, Air Force has come along to make it unanimous with a similar ruling. Progress payments on service construction jobs are being made as usual, with the contracting officer retaining 10% of monthly estimates until the work is half completed, and then paying full value (at the officer's discretion) on succeeding estimates.

Thus, 5% of the total is retained at the conclusion of the job, for payment after final inspection and acceptance of the project.

● **The White House is responsible for revitalizing the big scale lease-purchase program for federal building.**

The Budget Bureau, which had blocked the program by fixing an unrealistic 4% interest limit, has now wiped out the ceiling entirely. This means General Services Administration can seek financing contracts that are attuned to the current tight money market.

Two things led to the decision. Most important for the long run is White House fear that Congress might authorize direct appropriations (perhaps $1.5 billion or more) to pay for needed U. S. buildings, putting a new strain on the $275 billion national debt ceiling. The other is political pressure from members of Congress, eager to get authorized projects—some hanging fire since 1955—under way in their districts.

Ninety-seven GSA projects, originally estimated at $700 million, will get the initial push. Financing bids are already being asked on 10 of these.

● **The American Municipal Association is getting ready for a new battle to get more federal grants for urban renewal.** The association president, Mayor Ben West of Nashville, has asked 300 large and small communities to estimate their renewal needs over the next 10 years.

The association's objective: Take the steam out of arguments being put forth now by some high-placed Administration advisers that urban renewal is one place where federal government can start shedding responsibility.

NEW IDEA FOR FENCES—MAINTENANCE-FREE ALUMINUM GRATING

As shown above, Borden's pressure-locked Aluminum Grating has been used as fencing for the new J. L. Hudson Northland Shopping Center in Detroit, Mich.

The light weight aluminum grating forms a child-proof and maintenance-free fence. The alloys used were selected for their corrosive resistance and high strength.

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INCOMING PRESIDENT Louis R. Howson strongly supports moves for professional unity, as . . .

OUTGOING PRESIDENT Mason G. Lockwood tells of moves to strengthen society.

ASCE Looks Critically at ASCE

Strong indications that the leadership of the American Society of Civil Engineers is moving rapidly toward action on membership demands for organizational changes and aid on the economic front, dominated ASCE's 105th annual meeting in New York last week.

And members prowling the corridors and sitting in crowded meeting rooms found several other basic themes threading through the dozens of individual sessions that made up the week-long meeting:

- The need for stronger action on unity within the engineering profession.
- A heavy concentration on educational matters, in the interest of producing more and better-trained engineering graduates.
- Evidence of steadily increasing application of electronic computers to every phase of engineering work.

• Good—but not enough?—ASCE, in fact, set new records for attendance, with a registration of more than 2,200 But it was clear that even this "best effort" isn't enough.

The 40,000 member organization was told by both outgoing and incoming presidents—and by committee chairmen who have been analyzing findings of an opinion research program among the membership—that there is a lot wrong with the society, even though the speakers felt that the studies have already had the stimulating effect of a thorough-going self-analysis.

Significant contents of the opinion survey—contained in a report by the Opinion Research Corp. of Princeton, N. J.—were revealed in a series of speeches that took up the problems of member apathy, desire for greater society action on economic matters, need for better public relations, and strong pressure for professional unity.

One keynote on this matter was provided by Mason G. Lockwood, outgoing ASCE president, who launched his term in office a year ago with a personal survey of the society and what its local officers considered as its weaknesses. Reviewing a year during which he travelled more than 90,000 miles on society business, Mr. Lockwood pointed out that the survey-supported dissatisfaction among Junior members is already being acted upon. Efforts toward changes in membership grades (which would, among other things, eliminate the designation of Junior member) are well advanced. A special task committee will make its final recommendations on this matter to the Board of Direction at its next meeting at Chicago, in February, the retiring president said.

Much of the rest of the reports on the society's self-analysis amounted to a definite charge on the ASCE to strengthen activities at the local section level. The local sections, said the speakers, should take responsibility in such matters as recruitment of students and raising funds for engineering schools; should make much greater efforts in the field of public relations.

Overall, the society must also pay greater attention to the construction industry—to the fact that this industry depends upon civil engineers and that the society and its members should serve the industry more fully.

And one more point: The opinion research itself can't be accepted as a substitute for judgment, but must serve as a guide. It does provide all necessary guidance, however, for the

. . . ASCE takes critical look at itself

society to develop national and local activities to correct what its members consider to be its ills. There is now no need for the comprehensive study of civil engineering proposed earlier, concluded the speakers.

• **Unity through EJC**—On broader subjects, the meeting produced perhaps the profession's strongest blows in favor of professional unity through the Engineers Joint Council—and through no other agency.

Louis R. Howson, incoming ASCE president, made it very clear that his administration would do everything in its power to strengthen EJC as the unity organization that will speak for all engineers. "EJC is definitely the organization that has the breadth, the membership and the background to speak for the profession," Mr. Howson commented.

Joseph W. Barker, president of EJC, flatly rejected the current proposal of the American Institute of Electrical Engineers for a unity plan wherein the individual society would confine itself to technological matters; the EJC would limit its sphere to inter-society cooperation; and the National Society of Professional Engineers would become the spokesman in matters of promotion of the profession and advancing the status (including economic) of the engineer.

And Mr. Lockwood reinforced the pro-EJC comments by urging that NSPE quit operating as the only major engineering group not now a member of EJC, and join its sister organizations.

• **Economics**—According to the speakers the opinion research indicates that more than two-thirds of the ASCE

Spotlight on Underground Power Plants

ASCE's Power Division concentrated on underground powerhouses at the New York meeting. Four separate sessions were devoted almost exclusively to the subject. The symposium stemmed partly from the fact that the first large U. S. underground plant is currently under construction in California—the first to be built in the U. S. in 40 years. Other countries have a remarkable number of such plants, Italy leading with 57 and Sweden second with 26.

More underground powerhouses are bound to be built in the U. S. This forecast was made by both R. A. Sutherland of Ebasco Services, Inc., who helped organize the sessions and by J. Ackerman, consulting engineer of Madison, Wis., who presented a general discussion on the subject. Mr. Ackerman said that the geology and topography of the U. S. haven't yet forced underground development, but important future developments can be expected.

The symposium presented extensive data on underground plants throughout the world. Engineers from Sweden, Italy, Canada and Australia discussed developments in those countries. And U. S. engineers told of underground plants in Switzerland, Brazil, the Philippines, Scotland, Japan and the U. S.

Although defense considerations have been factors in placing some plants underground, the most compelling reasons for underground powerhouses have been economic. In northern areas of Italy, Sweden and Canada construction can be continued on underground plants all year round. And in those countries, danger of rock- or snow-induced avalanches has driven plants underground. Ability of underground plants to develop more head and thus generate more power has been important also in many places. Savings in materials costs in remote areas have also been considered. Increased efficiency in underground construction in recent years, resulting in excavation costs not increasing as rapidly as other costs, has been still another favorable consideration.

The two leading underground powerhouse countries—Italy and Sweden—were represented on the symposium by speakers. Carlo Semenza of Italy said that there are 57 plants currently in operation in his country with eight more under construction. In 1960, total capacity will be 4.5 million kw or 30% of Italy's entire electric generating potential. Poor geologic conditions in Italy have complicated the situation. The sedimentary and metamorphic rock is badly broken up and includes heavy water percolation. Thus, powerhouse arches are excavated and concrete lined in most cases before undertaking further excavation. Often, wall chambers are excavated and concentrated before excavation of the main portion of the machinery hall. Mr. Semenza pointed out that plants are never placed underground without first making a detailed comparison with the best possible surface power plant scheme for the site.

UNDERGROUND POWER such as generated in Canada's 1.2 million hp Bersimis plant will become more important in future construction ASCE speakers said.

membership want the society to intensify its efforts on the economic front.

In answer to this demand, a task committee under Milwaukee city engineer Lloyd Knapp recommended that the society act immediately to:

- Reestablish a Washington office.
- Educate ASCE members as to the limits on legislative activity that are imposed on the society and its local sections, since they must be concerned with their tax status as a scientific and educational organization.
- Add staff to help the local sections with advice on any proposed legislative activity.
- Do more in the field of salary recommendations.

And this committee added its own weight to previous recommendations for professional unity, calling such unity "a necessity for concerted action toward economic betterment of engineers." In this same line, the committee also urged continued emphasis on licensing; intensification of public relations efforts; publicizing violations of the Code of Ethics (except for identities).

On the question of economics, incidentally, action on the matter of fees for services was sought by U.S. Highways Administrator Bertram D. Tallamy. Addressing the annual awards luncheon, Mr. Tallamy made a special appeal to the group for establishment of new fee curves, to be used by highway agencies at all governmental levels, to "help clear the atmosphere" in evaluating services provided to the agencies by consulting engineers.

- **Education**—Actually, it was the task committee on professional education, under consultant A. J. Ackerman of Madison, Wis., which ordered the opinion research—the springboard from which most of ASCE's self-analysis took off.

The committee's own findings—after four years of work—emphasized the needed activities of local sections in the matter of selling engineering as a career to secondary-school students, and to work with the schools to raise funds to be applied to teaching salaries.

The question of salaries for engineering educators was a recurring theme, also in many of the sectional meetings and in corridors. A key complaint: Private industry, on one hand, is consistently raiding teaching staffs for technical personnel, getting them with offers for more money; and on the other hand, complaining mightily that the schools are inadequately staffed and turning out poorly trained graduates. Remedy, suggested by many, would be industry contributions to the schools for better salaries, industry forbearance in stripping the schools of their teachers.

Several other committees and sectional meetings also produced comment on educational matters—most of them centering around the fact that a majority of society members feel that present-day engineering education is less than adequate. Many would like to see some upgrading of engineering schools in their relationship to the parent university. The researchers found that two-thirds of ASCE members want the civil engineering course extended to five years. Educators are not nearly so strong on the five years.

- **The computers**—Probably the best evidence of the interest in the use of computers was provided by the spectacle of the delegates attending the Engineering Mechanics Division session parading through the halls at the Hotel Statler one afternoon of the meeting, in search of a larger meeting place.

Originally the session had been set up in one of the huge hotel's smaller meeting rooms, set to accommodate perhaps 100 persons. But when more than 250 men showed up, the speakers, H. A. Radzikowski and S. E. Ridge, of the U. S. Bureau of Public Roads, and the session chairman, had to find another hall.

But talks and panel discussions on

Sweden's underground powerhouse situation was discussed by K. V. T. Nilsson, director of the Swedish State Power Board. In that country there are 26 plants in operation with a total capacity of 2.7 million kw, half of Sweden's total hydro capacity. And 18 more plants are under construction that will add 2 million kw capacity. Perhaps the most remarkable Swedish developments are the current construction of an underground steam plant and the planned construction of an underground atomic plant. In the steam plant, each generating unit will be placed in a separate machine hall. And the oil supply will be stored in unlined underground chambers. The atomic plant is planned for first generation in 1963 with initial capacity of 100,000 kw expandable to 500,000 kw. Placing the nuclear reactor in a separate underground chamber will have obvious added safety.

Underground plants in many instances have been located directly underneath small diversion structures with a vertical shaft connecting the two. This, of course, results in long tailrace tunnels—some as long as 6 or 8 miles. Such construction permits concentration of available head at big stations with resulting lower unit costs. And by making the penstock vertical, cost savings result in this expensive component.

Contributing to the development of underground power plants in Sweden, Mr. Nilsson pointed out, is development in that country of improved drills as well as drilling equipment and techniques. One such technique is smooth surface blasting. Holes placed close together are blasted separately with special charges. Result is smoother tunnels and underground surfaces with less head loss and less concrete.

Except perhaps for Canada, developments in other countries have been less impressive. And Canada's developments are not so impressive in total numbers as in size. I. W. McCaig of H. G. Acres & Co. pointed out that Canada has the three largest underground plants. The Kemano plant in British Columbia has 1.12 million hp installed capacity and will ultimately be expanded to 2.2 million hp. The Bersimis plant is to have 1.2 million hp capacity and currently under construction is the Chute-des-Passes plant that will have power on the line in 1959.

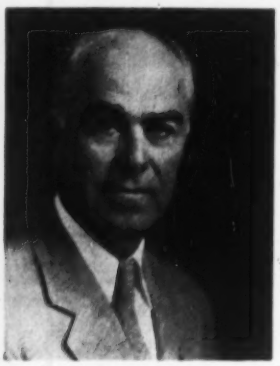
The only underground plant in the Philippines—the Ambuklao plant—was described by Andrew Eberhardt of Harza Engineering Co., Chicago. This plant has horizontal setting of the shaft between generators and turbines—as have many other plants particularly in Italy.

The new U. S. underground plant is the Haas plant of the Pacific Gas & Electric Co. (ENR Sept. 19, p. 54). According to J. Barry Cooke of PG&E, savings in putting the 150,000 kva plant underground amount to something on the order of $750,000. Although this is somewhat less than expected, it nevertheless justifies the venture. Shortening the penstock with its heavy steel lining saved $800,000 including consideration of longer tailrace tunnel excavation. But the underground plant cost some $500,000 more than would a comparable surface plant for a net construction saving of $300,000. Added to this is the capitalized value of $450,000 due to 30 ft more head.

A saving of almost half a million dollars resulted from not lining the invert of the Haas power tunnel. In fact, the invert wasn't even mucked clean. Instead, a much larger sand trap was constructed that will capture debris washed down the 6 mile tunnel.

Outstanding research on rock bolting was described by Thomas A. Lang, associate commissioner of Australia's Snowy Mountain Hydro-Electric Authority. The research was conducted in connection with the 320,000 kw T1 power station of the Snowy Mountain development. Due to very poor rock conditions, rock bolting or some other form of support was needed at T1. Model and photoelastic investigations proved that properly installed and tensioned rock bolts could hold almost any formation.

. . . ASCE presents honorary membership to two in U. S., two abroad



HIGHEST HONOR, honorary membership, was conferred on (left to right) Karl Imhoff, sanitary engineer of Essen, Germany; Lorenzo Perez-Castro, consulting engineer of Mexico City; Howard S. Morse, chairman of the board of the Indianapolis Water Company; and Whitney C. Huntington, recently retired head of the civil engineering department at the University of Illinois. In other actions, ASCE members seated two vice-presidents, Waldo G. Bowman, Editor of Engineering News-Record for Zone I; and Samuel B. Morris, consulting engineer of Los Angeles, for Zone IV.

computers appeared in almost all of the sectional meetings: hydraulics, highways, sanitary engineering, structural design, and others. In every case, it was obvious that the audience was acquainted with the new wonder machines, but wanted details on their operation and possible uses.

Beyond the meetings and reports of general nature—and, of course, the several major social portions of the meeting—sessions of the various technical divisions produced their own special matters of interest. In thumbnail, here's how the divisional meetings went:

Structures

In joint sessions with several other divisions, the Structural Division turned the spotlight on lateral forces that act on structures, and the problems of developing resistance to meet wind, air pressure, water waves and seismic forces.

From the discussion on wind forces, it was clear that much remains to be done in the matter of computation of loads. Commented John M. Biggs, of Massachusetts Institute of Technology, who presided at the session: Little has been done recently on this computation —it has not kept pace with the progress in design methods.

And F. B. Farquharson, director of the Engineering Experiment Station for the University of Washington, at Seattle, emphasized the non-static nature of wind loads. "The determination of wind forces on a structure is basically a dynamic problem, but it has been conventional practice to treat such forces as static loads," he said. "This approach is satisfactory—provided that the relationship between the time variation of the wind and natural frequencies of the structure is such as to cause an essentially static response.

The discussion of blast forces made it clear that the increase in size of nuclear weapons—now measured in megatons rather than kilotons—has affected much more than the radius of damage.

Cmdr. H. L. Murphy, director, Passive Defense Division, Bureau of Yards and Docks, explained that blast loading is a function of overpressure, dynamic pressure, reflected pressure (in some cases), shock front and seismic velocities; plus the size, shape, orientation and response of the structure itself.

"The interaction of the incident blast wave with a structure is a complex process for which theory has been developed, based on test data from shock tubes, wind tunnels, model studies, and full-scale tests with high explosive and nuclear weapons," he said. For details, see "The Effect of Nuclear Weapons (1957)," Supt. of Documents, Wash. 25, D. C.

Arsham Amirikian, of the Special Structures Branch, Bureau of Yards and Docks, urged the society to "take the lead" and seek cooperation of other technical groups in the development of design criteria and other techniques for human protection. "The increase in size of nuclear blasts makes it imperative that blast resistance be designed into all structures," Mr. Amirikian told his audience.

John A. Blume, San Francisco consulting engineer, reported that studies of the behavior of two buildings subject to actual ground movements in four earthquakes indicated that buildings that are more flexible and provide more damping of vibration are subject to less shear. He added, however, that the shears can be considerably greater than those computed with the seismic design coefficients in the San Francisco Building Code and the Uniform Building Code.

While most codes call for coefficients for base shear from 0.02 to 0.15 g, Mr. Blume found that actual earthquakes produce shears of 0.5 g or more for buildings with fundamental natural periods of 1 sec and 0.3 g for buildings with periods of 1 sec.

Engineering Mechanics

Plastic design theories for structural steel came under close scrutiny in two meetings sponsored by the Engineering Mechanics Division.

As explained by Lynn S. Beedle, chairman, Structural Metals Division, Lehigh University, the plastic theory is based on the high ductility of steel, which permits beams to continue to carry additional loads after the yield point is exceeded at one section. Hinges are assumed to form in continuous beams at points of peak bending moment, he said. "As a result," he added, "moments are redistributed to less stressed sections." (see also ENR April 4, p. 38)

One advantage of use of the theory is that rolled sections can be used for longer spans or heavier loads, with resultant economy of material and lower fabrication costs.

Several structures—one story, single-span rigid frame—have been built recently in the U.S., according to T. R. Higgins, director of engineering research of the American Institute of Steel Construction. Of five he described, one was a gable bent for a warehouse at Sioux Falls, S. D., which has an 88 ft span, for which plastic design permitted use of a 24 WF 94, with a 1.85 safety factor. Column height is 15 ft, and the rafter rise an additional 8 ft. Mr. Higgins pointed out that had the bent been designed by elastic theory, with tapered haunches and tapered columns, an 18 WF 55 would have sufficed for the rafter between haunches, requiring 30% less steel than the design adopted.

However, Mr. Higgins added, the fabricating cost would have been much greater, making a dollar saving doubtful. Tapered haunches also could have saved weight with a plastic design. The saving, though, might not have been large, since the haunches would have been proportioned to remain elastic even under ultimate load. The deciding factor was deflection. Under service loads, the ridge will deflect vertically 2¼ in. corresponding deflection in a lighter frame with haunches would have been 6½ in.

Surveying and Mapping

Reflecting the great degree of mechanization that has become standard in this field, the Surveying and Mapping Division devoted most of its sessions to discussions of new measuring devices and the spreading use of photogrammetry in surveying work.

The measuring devices were the Geodimeter and the Tellurometer—both electronic distance measuring devices. The instruments are considered to give best results at 10 to 30 mile range, both are easily transportable over rough terrain, and their accuracy is considered great.

On photogrammetry, the section heard Carlos A. Weber of the Michigan State Highway Department, describe the method used for a "beacon tower around which the route location studies have centered" in his state. He commented that the method has been applied to route location, planning, traffic studies, bridge and road design, drainage studies, and other uses.

"Any method that can reduce the amount of detailed office work, tedious hours of leg-weary investigations, will help overcome the shortage of experienced engineers," he added.

Hydraulics

Underscoring an oft-neglected phase of water projects, the division devoted a session to the problem of sedimentation in reservoirs.

Speakers called attention to the fact that sedimentation is not necessarily a long-term effect—that in smaller reservoirs, sedimentation can reduce capacity by one-third in a few years. The talks were concerned with how to design for sedimentation, rather than with how to remove sediment or prevent its occurrence.

In order, the papers concerned themselves with predicting horizontal and vertical distribution of sediment, predicting rates of sedimentation, and how to convert weight of sediment to the all-important volume measurement. What will emerge from these discussions according to division's plans is a simplified design manual.

Highways

Coordination was the basic theme of the Highway Divison's meeting—coordination of design, of where exit and entrance ramps are placed, of signing and signalling, and of all engineering and construction activities.

Representatives of all levels of government—federal, state, county and city—stressed the same theme in their detailed papers, commenting on the need for cutting down the number of decisions that a motorist must make at high speed, but also on the necessity of relieving monotony on the nation's now-building highway system.

That coordination, too, said the speakers, extends to the problem of keeping the general public informed as to the progress of the program, the need for it, and how it's being done.

One note of warning was sounded by Donald C. Wagner, of the Philadelphia city administration. He commented that neither the federal government nor the states have any concern with mass transit but that this is the key to unlocking the traffic jam in most major cities. "We should depend, for a substantial portion of peak hour trips to and from the business district, on rail mass transit—or else they will face a heavy burden in the decline in values of their central business districts."

Sanitary

Placing heavy emphasis on the use of computers, Sanitary Division members devoted one entire session to discussions of uses of the machines in their field. They heard comparisons of the Philadelphia Water Department's network analyzer (an analog computer) and the digital computer (the analog system came off best, because of the size and complexity of the job); discusisons of other uses in pipeline analysis work, backwater curves and water yields of reservoirs; reservoir capacity and pattern of use data.

In other sessions, the Sanitary Division was told that the U.S. Public Health Service will publish annual data on water quality, which it hopes will indicate long-term trends in quality of the nation's rivers, provide guides for pollution control standards, and aid in planning water resources projects.

Construction

The Construction Division hung out the standing-room-only sign at its session on finance, as members listened to talks by W. C. Bloom, controller and assistant treasurer of the Raymond Concrete Pile Co., and Eugene Rau, vice president and chief engineer of J. Rich Steers Co. Between them, the two men covered the questions of financial management, and bidding and estimating of heavy construction projects.

Said Mr. Bloom: Of five fundamental mistakes that cause contractor failures, four are matters of financial management—undertaking work for which the contractor lacks experience or knowledge; bidding work with greater financial responsibility than the contractor can meet; bad record keeping; inability to relate or understand cost information. The fifth cause is inadequate mark up in pricing a job in relation to total funds employed.

Said Mr. Rau: "Estimating . . . is dangerous, and therefore should require more attention to details prior to bidding. Construction executives must familiarize themselves with the plans and specifications, then establish in their own minds methods by which the job can be done; then visit the site to see whether the method they have determined is completely feasible."

Cancellation Looms

Contract in jeopardy as Cowlitz is set back again

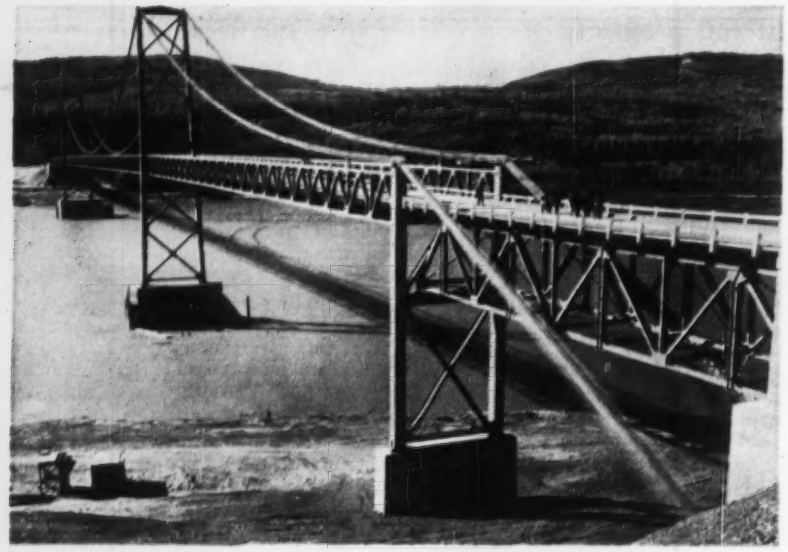
Hopes that the City of Tacoma, Wash., might resume construction of its Cowlitz River hydroelectric development this year were dashed when the Washington State Game Commission rejected the city's "guarantee" to maintain fish runs in the river.

Adverse action by the commission means that the city probably will have to cancel a $10 million contract for dam construction it awarded two years ago.

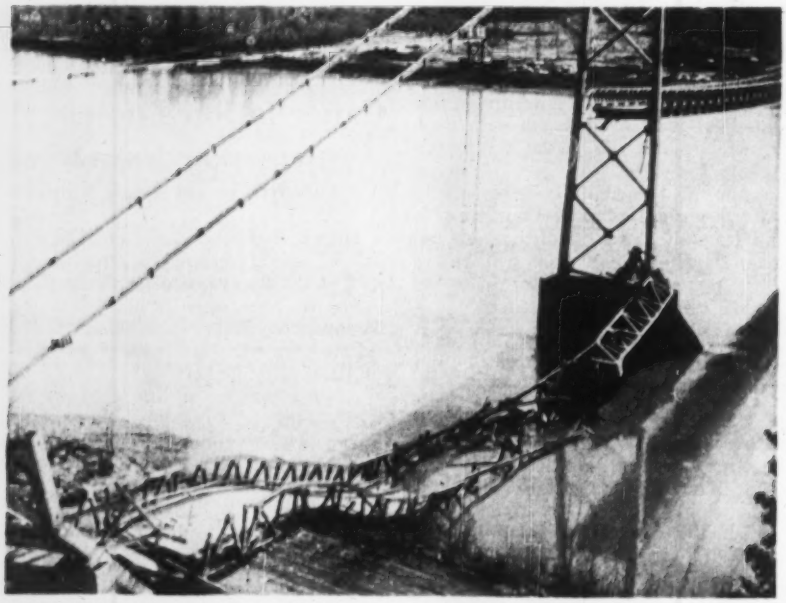
Tacoma City Light promised to replace the fish hatchery and "guarantee to maintain the runs of salmon and steelhead into the Cowlitz." Fisheries officials said the only guarantee they would accept would be a demonstration that the city's plans actually would bring fingerlings past the dam.

Tacoma City Light had hoped the commission might sell its Mossy Rock trout hatchery to the city, permitting construction of the first of two proposed dams. Mayfield Dam, on which preliminary construction was halted earlier this year, would flood the hatchery, which the state would not sell and the city could not condemn.

Tacoma has appealed to the U. S. Supreme Court a decision of the State Supreme Court denying the city's right to condemn the state hatchery. But final disposition is unlikely before the end of the year, the deadline set for cancellation of the construction or resumption of work.



BEFORE FAILURE Peace River Bridge presented this appearance to the traveler on the Alcan Highway some 35 miles north of Dawson Creek in British Columbia.



AFTER FAILURE caused by a slipping anchorage, the north bank suspended span, the cable bent (bottom left corner of picture) and an approach truss were twisted wreckage.

Anchorage Slip Wrecks Suspension Bridge

A gamble on poor foundations, which paid off for nearly 15 years, finally was lost on Oct. 16 when the north concrete anchorage block of the Peace River Bridge on the Alcan Highway in British Columbia moved forward some 12 ft on its shale base. The consequent slacking off of the main cables tipped over the cable bent, dropped the suspended side span so suddenly that it ripped loose from its 2¼ in. dia hangers, and crashed. Despite the fact that the main span undulated in large vertical waves, neither it nor the far side span collapsed. Although poised precariously, they were still in position at last report, with the main span some three feet below its normal level.

Built in 1942 as part of the rush war program to complete the Alcan Highway between the United States and Alaska, the Peace River Bridge has a main span of 930 ft. Its suspended side spans are 465 ft long between the main towers and cable bents. A simple truss span of 135 ft joins the cable bents to the anchorages. The main cables, 30 ft center to center, are of parallel strand open-type construction, each cable consisting of twenty-four 1⅞ in. strands arranged in the form of a rectangle, 6 high and 4 wide. The stiffening trusses are 13 ft deep, fabricated of plain rolled sections as are all other structural elements of the bridge. The roadway, 24 ft wide, is of concrete. Superstructure, design and erection were described in ENR Jan. 13, 1944, p. 26.

Canadian Army Engineers, who are in charge of maintenance of the bridge, have not determined the exact cause of the anchorage slip, but believe either that the shale of the foundation deteriorated into clay or that a slide originated in some adjoining strata. Because of the rush nature of the job, no piling was used either under the anchorages of the piers. Two years ago serious scouring under one of the main tower piers required some major underpinning.

First indication that the anchorage was moving came about 12 hours before the collapse, when a water supply line crossing the site to a new scrubbing plant of the Pacific Petroleum Co. was cut. When employees investigated they found indications of ground movement at the anchorage. The bridge was immediately closed to traffic, but no measures were possible to arrest the movement of the anchorage. Reminiscent of the Tacoma Narrows Bridge failure in 1940, a large crowd gathered to watch the collapse, which was also well photographed when it occurred at 1 pm Oct. 16.

The Peace River Bridge was designed and its construction supervised by the U.S. Public Roads Administration, predecessor organization to the present Bureau of Public Roads. The foundation contractor was the DuFerin Paving Co., Toronto; the superstructure contractor, the John A. Roebling's Sons Co., Trenton, N. J. Bethlehem Steel Co. fabricated the towers and cable bents, and the Belmont Iron Works, Philadelphia, the roadway steel.

Loss of the bridge poses a serious transportation problem, since all materials for northern gas and oil exploration have moved over it. In addition, freight bound for Yukon and Alaska was a heavy user of the bridge. The Canadian Army Engineers have put a small ferry in service 10 miles downstream to carry loads of essential food across the river, and will build a trestle crossing to be available when ice shuts down the ferry.

Consideration also is being given to planking the new Pacific Great Eastern Railway Bridge upstream for use of highway traffic. A Canadian Army spokesman has announced that designing will begin at once on a pier type structure for the Alcan crossing so that construction can start next spring.

Eyes on the Road

Highway officials talk over interstate program issues

The interstate system and the federal programs which have introduced new problems and intensified old ones held the attention of the more than 1,000 delegates attending the Southeastern Association of State Highway Officials in Atlanta this month.

C. D. Curtiss, Commissioner of Public Roads, U. S. Department of Commerce, told the 16th annual convention that "we can glimpse the real potential of the new highway program by looking at the federal aid funds available for the fiscal years 1957, 1958 and 1959."

He pointed out that the total for the 12 states represented at the convention comes to $1.4 billion, which includes $1 billion for the interstate system. A total of only $1.8 billion in federal-aid highway funds was apportioned to the Southeast in the 40 years that preceded the 1956 act.

Mr. Curtiss said the Southeastern region as a whole had made good progress carrying out the interstate programs but that the 12 state area had obligated only 93% of its appropriations from fiscal 1957 on federal projects, while nationwide states have already obligated 29% of 1958 monies. Mississippi, with 47% of its 1958 funds obligated, was ahead of the national average.

He added that the nation is on schedule with its highway work, and that as of Sept. 1, 1957, contracts have been advertised and funds obligated totaling $2.6 billion as federal aid on primary, secondary and interstate systems.

Stuart Rothman, solicitor, U. S. Department of Labor, told the meeting that enforcement of the Davis-Bacon Act since January, 1953, has restored $1.1 million in back wages to workers on federal and federally-assisted projects.

H. L. Nelson, director of the Alabama Highway Department, moved up from vice president of SASHO to the presidency, succeeding F. A. Davis, deputy commissioner and chief engineer of the Virginia Department of Highways. Wilbur E. Jones of the Florida Highway Commission was named vice president.

Ohio Valley Association Urges Increased Spending

The Ohio Valley Improvement Association, during its recent 62nd annual convention at Cincinnati, recommended that nearly $120 million be spent in fiscal 1959 on Ohio Valley water resources improvements.

The recommendation is more than double the $50 million Congress allowed this year. The total includes suggested continued expenditures of $10.7 million on the New Cumberland dam and lock, $11 million at Greenup, $12.6 million at Markland, $7.9 million at Dam 41 and $5 million at New Richmond.

The figure also includes a new total of $46.2 million for continued flood control projects in seven states and $16.7 million for lock and dam projects on Ohio tributaries.

The convention adopted a resolution opposing tolls or user charges on U. S. waterways.

The group reelected Harry M. Mack, president, and Hudson Biery, executive vice president.

Insurance Firm Dedicates 20 Story Home

The new home office of Mutual Benefit Life Insurance Co. has been formally dedicated in Newark, N. J.

Biggest unit in Mutual's $20 million building program in downtown Newark, the 20 story structure cost more than $12 million. Its companion projects in the overall program include a 3 story parking garage, now under construction, and two 6 story office buildings, one of which appears on the left side of the photo.

The insurance firm is occupying 12 floors of its new building. Tenants will take 6 floors, which are now being finished for spring occupancy. The 9th and 18th stories are devoted to mechanical and electrical equipment. Floor space in the building totals 485,000 sq ft.

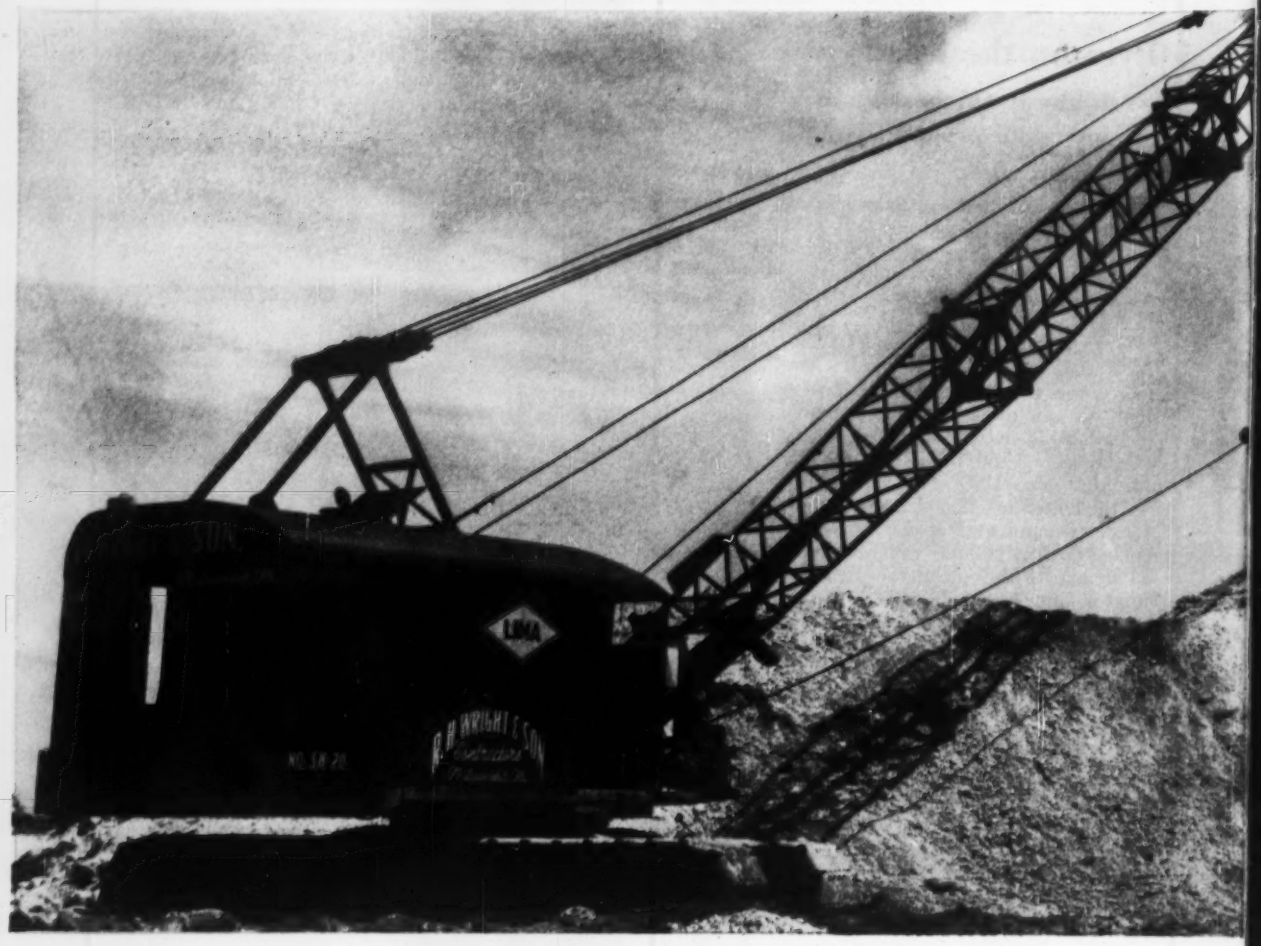
The building is completely air conditioned. Chilled or heated water is circulated to peripheral convectors from cooling units and boilers in the basement. Blowers are located in the basement and on the 9th and 18th floors. Cooling towers are on the roof. Separate compressors and fans on the second floor serve the electronic tabulating room on that floor, providing closer control of temperature and humidity and more cooling proportionately than the rest of the building requires.

The exterior of the building is limestone and blue-green glare-reducing glass, framed in aluminum and stainless steel. Floors are covered with rubber or vinyl tile. Ceilings are acoustic tile. Recessed fluorescent lighting provides general illumination of 50 ft-c at desk level in large office areas.

Mechanical services include 10 automatic elevators and a pneumatic message-delivery system.

Architects for the building are Eggers & Higgins; structural consultants, Weiskopf & Pickworth; mechanical consultants, Syska & Hennessy—all of New York City. George A. Fuller Co., of New York City, is general contractor.

Architects for the other three projects are Frank Grad & Sons, of Newark, with Eggers & Higgins collaborating on one of the office buildings. General contractor on all three of the other projects is William L. Blanchard Co., of Newark.



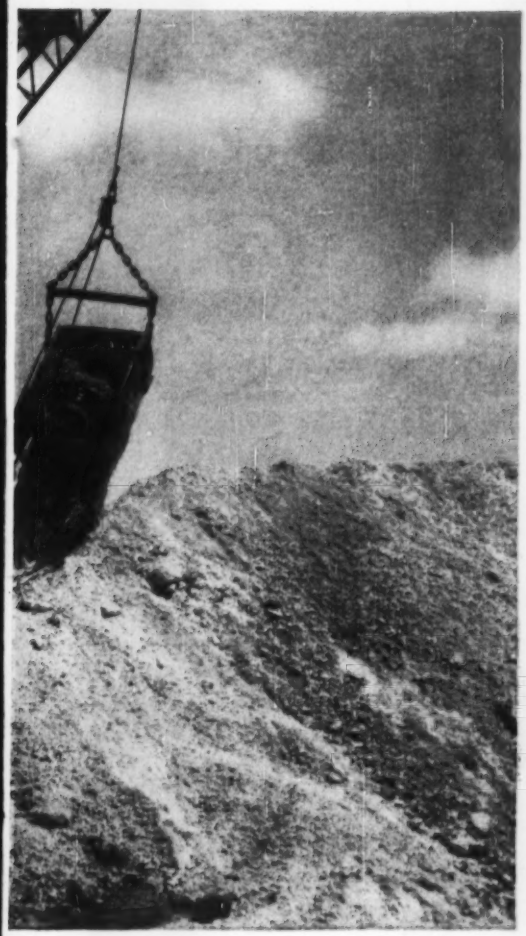
Stockpile for the road foundation. The material is taken from the edge of the Gulf of Mexico which parallels the project at this point on the Florida Keys.

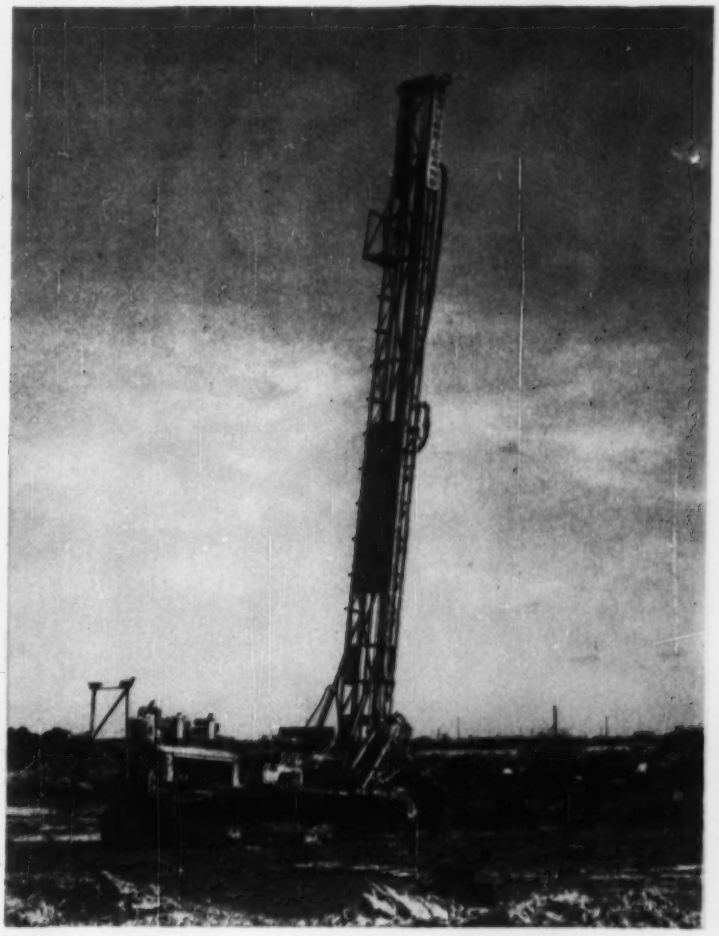
Gulf Products and Fine Service

Left to right: Jimmy Smoak, Superintendent, R. H. Wright & Son; P. J. McConnell, Engineer, Florida State Road Commission; and L. F. Proctor, Assistant District Manager, Gulf Direct Sales, Miami.

Seventy days along on a 350-day job and 23% ahead of schedule! That's the news from the Boca Chica Naval Air Base bypass project seven miles north of Key West, Florida, on U. S. No. 1. Working at such a fast pace demands top performance and protection from fuels and lubricants to keep equipment on the go. Says Jimmy Smoak, Superintendent of Contractors R. H. Wright & Son, Fort Lauderdale, "All concerned with the job are well pleased with the performance of Gulf products and service."

Gulf can serve you too. 1500 strategically located warehouses, in 32 states, stand ready to supply you with a steady flow of quality fuels





Mayhew Hurricane Drill, mounted on International TD-18 Tractor, sinks blasting holes to a depth of 30 feet near edge of the Gulf.

keep equipment rolling on Florida highway project

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Dozing—But Never Dozing Off. Moving earth for new Interchange north of Washington, dozers average 3000-4000 hrs. before overhaul using Cities Service C-300 Motor Oil!

Greene in Name Only. Veteran construction man Ralph Greene is one of Washington's largest earth movers. He refuses to baby his trucks. With Cities Service lubricants they can take it!

At work on new Interchange: Greene & Dyer, Inc., Washington, D. C.

Trucks go 7000 hrs. without overhaul—Shovel chalks up 8500 hrs.

Big earth mover strikes paydirt with Cities Service Products

In the past year, Greene & Dyer, Inc. has moved 1½ million yards of earth in building an Interchange for the new road system north of Washington, D. C.

To do it, President Ralph Greene has kept his trucks, dozers and shovels running constantly under grueling mud and dust conditions. For, as he says: "We're in business to move dirt, not to baby trucks."

Nevertheless, Greene's equipment is rolling up one record after another, using Cities Service C-300 Motor Oil and Cities Service fuels and greases.

Dozers are getting 3000-4000 hours before overhaul. Trucks are rolling up 65,000 miles—or about 7000 hours each. And one shovel has gone 8500 hours with no overhaul yet needed.

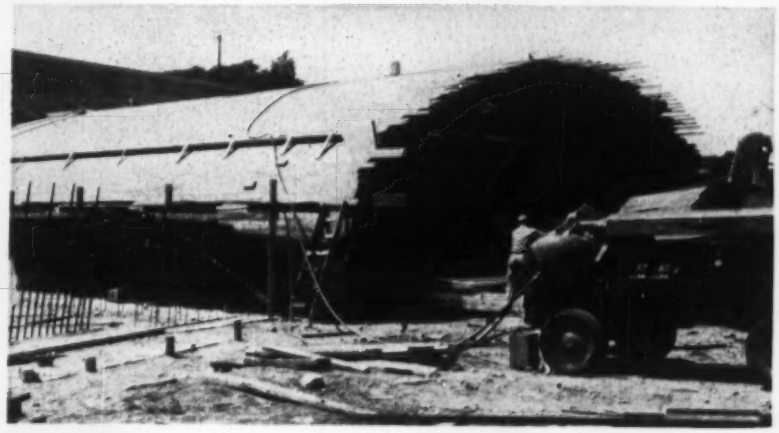
Says Greene: "That's proof enough for me that Cities Service products are the best I can use. I'd recommend Cities Service to anyone whose work demands fuels and lubricants that can take it."

CITIES SERVICE

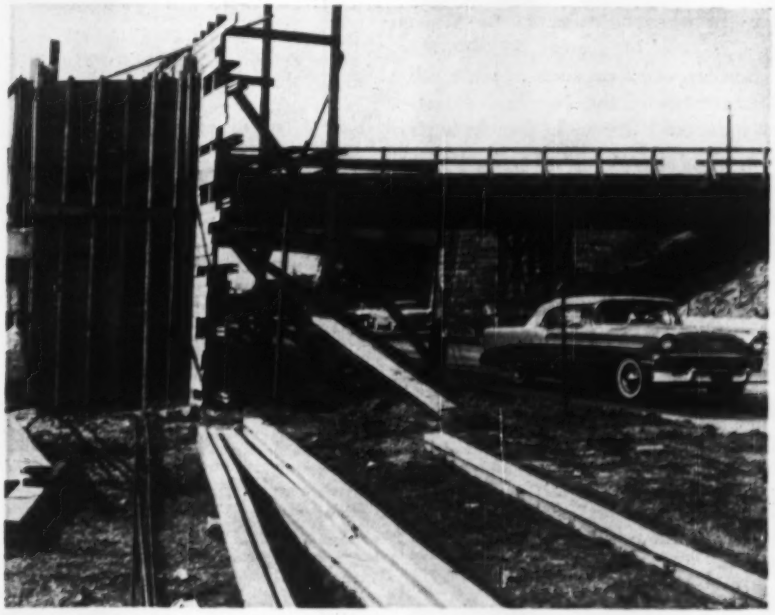
QUALITY PETROLEUM PRODUCTS

New connections to an old parkway pose special problems for engineers concerned with maintaining character of roads. This consideration dictated . . .

Arches Provide Parkway Connection



Barrel arch to carry parkway over major traffic artery requires heavy formwork, special design to provide clearance for vehicles below. New arch will abut old.



Temporary bridge in another section of interchange stands on heavy oak posts, set on 12 in. oak sills. New bridge here will be simple girder type.

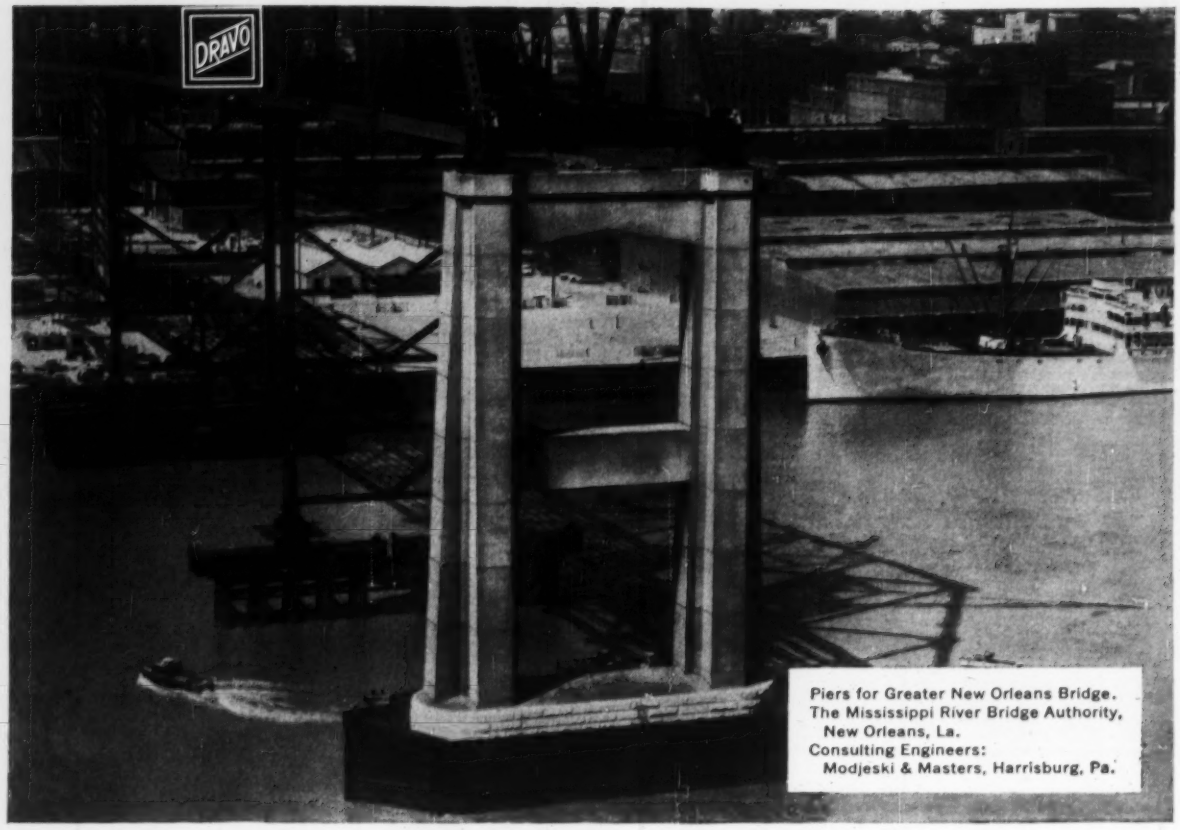
Determined to preserve the design integrity of its 23-year-old Northern State Parkway, the Long Island State Park Commission is now engaged in building duplicates of two barrel-arch structures so exact that the facing stone will even come from the original quarries.

The structures are necessary to carry the four new lanes of pavement by which Northern State Parkway is being widened to handle traffic from the brand-new Meadowbrook State Parkway on the south and the Long Island Expressway (ENR Sept. 26, p. 50) now under construction to the north. When complete, these two miles of the Northern State Parkway will be an eight-lane divided roadway, with four traffic lanes in each direction.

The problem is that at the point of intersection of the Meadowbrook and Northern State Parkways, three other major roads also come together. All of these arteries carry extremely heavy traffic, both commercial and private vehicles, that plies between the heavily built up areas, major aircraft plants and numerous small industrial plants in the region. And when—to this normal traffic—the heavy influx of vacation motorists is added on any summer day, the complexities of keeping traffic moving around the 1.08 miles of construction site is obvious.

In order to make the connection and provide for traffic flow in four compass directions on the two parkways, the plans call for the Meadowbrook parkway to cross under the old, coming up on the north side to make the junction. This program involves construction of three new bridges of some size for the parkway crossovers, and 1.6 miles of access roads and ramps. In addition to the three bridges, the job will involve about 216,000 cu yd of earthmoving and construction of two recharge basins to dispose of runoff water.

• **Barrel arches**—One of the three bridges—across Glen Cove Road, to the south of the old parkway—is a conven-



Piers for Greater New Orleans Bridge.
The Mississippi River Bridge Authority,
New Orleans, La.
Consulting Engineers:
Modjeski & Masters, Harrisburg, Pa.

34-story stepping stone for Nation's longest Cantilever Bridge

Extending 162 feet above low water and 180 feet below, this pier of steel and concrete will serve as a stepping stone for a new bridge across the Mississippi River at New Orleans. From it a four-lane highway bridge will take a giant step of 1575 feet to the next supporting structure on the opposite bank.

The new span, linking expressway systems on both sides of the river, will speed traffic into and out of New Orleans. The four main piers were constructed by Dravo at a cost of almost $7,000,000. Similar work on such notable substructures as the Natchez, Mississippi, and Newark Bay bridges, helps explain Dravo's reputation for difficult construction "in and around water."

For more information on any of the services and products for industry shown below, write to DRAVO CORPORATION, PITTSBURGH 25, PENNSYLVANIA.

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. . . Arches provide parkway connection

Biggest temporary bridge carries 56 ft wide road over parkway on new location, while new arch is built behind old one visible at left.

tional post-and-beam structure, with its deck-girder steel carried on cast-in-place reinforced concrete piers founded on spread footings.

But the other two structures—to carry the new parkway over Jericho Turnpike, and to carry Hillside Ave. over the doubled-up parkways near the junction point—will be concrete barrel-arch structures, designed to match the stone-faced bridges that were built for the original road.

• **Next to, and behind**—The biggest of the two structures is that crossing Jericho Turnpike, being built parallel to and flush against the existing arch. The second arch will be butted behind the one carrying Hillside Avenue over the Parkway, so that this bridge will become a two-arch structure, bridging both parkways.

The Jericho Turnpike bridge will be 86 ft long, from abutment to abutment, 58 ft wide, and set on a 17 deg. skew. The monolithic arch ring will be 6 ft 6 in. thick at the haunches, tapering to 2 ft in thickness at the center. The Hillside Ave. bridge will have an overall length of 64¼ ft. Both structures will provide a minimum clearance of 14 ft 4½ in. at center, and 11 ft 1 in. at the curb line.

Both structures are to be carried on spread footings, roughly 12 ft wide and 56 ft long (along the width of the bridges), the heavy concrete pad being an average of 4 ft thick, resting on the excellent gravel subbase.

Since the Jericho Turnpike structure bridges one of the areas' busiest highways, formwork for the arch presented a special problem for Hendrickson Bros. of Valley Stream, L. I., which holds the $1.8 million contract for the whole job. The heavy formwork necessary to carry the arch must not interfere with the free flow of traffic below.

Under rigid state specifications, the contractor designed falsework consisting of 8 x 10 in. oak posts, set on oak plates and wedges on the existing road surface. Supported by these posts are a series of 2 x 12 in. ribs set 12 in. on centers. The posts themselves are set 2 ft on centers from the springline to a point just above the main-travelled four-lane roadway. Over the four-lane roadway, three sets of post-columns carry 16WF, 50 lb steel girders, set 3 ft on centers, to provide clearance.

These ribs are roofed over with timber lagging, wedged to reach proper curvature, then covered with plywood. The under side of the arch will be given a tool finish.

Since the Jericho bridge abuts the existing structure carrying the Northern State Parkway, a 1 ft 6 in. sector of the new arch will be left out of the original pour. After the new structure has been allowed to reach its full settlement under loads, reinforcement will be inserted in this key, and the slot filled.

At the Hillside avenue site, the new arch will be directly behind the old, so formwork can be constructed without regard to passage beneath.

The project is being built for the Long Island State Park Commission, under engineering supervision of the State Department of Public Works.

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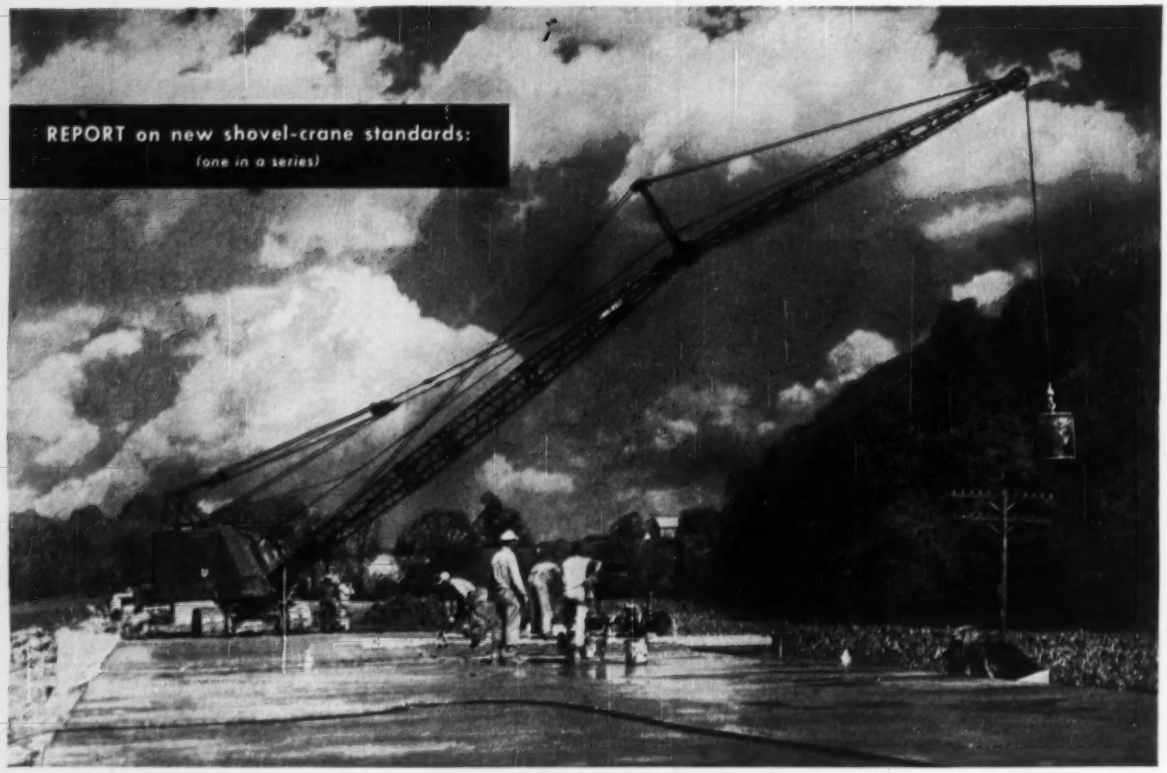


NEW FEATURES—Link-Belt Speeder shovel-cranes offer many important production-increasing advantages including reversing clutches for either or both main drums, a third drum and independent rapid boom hoist for power-raising and power-controlled lowering.

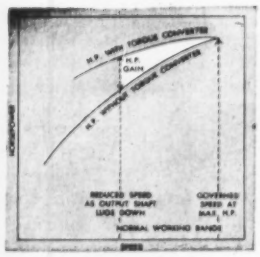
Getting bonus power...extra line pull

Size for size, Link-Belt Speeder shovel-cranes deliver greater usable horsepower than other machines using the same engines

Engine size alone is not a correct measure of a shovel-crane's actual *usable* horsepower. Thus, it's important to know Link-Belt Speeders deliver more *usable* horsepower or line pull at the drums than other machines using the same engine, yet remain well within engine manufacturers' recommended operating speeds.

Why? A Link-Belt Speeder is designed and built with extra size and strength in shafts, gears, clutches and structural members. It has the strength to fully utilize available engine power.

It's another reason why Link-Belt Speeder shovel-cranes are setting entirely new high standards of efficiency. For complete facts, contact your Link-Belt Speeder distributor or write—Link-Belt Speeder Corporation, Cedar Rapids, Iowa. 14,470-B



TORQUE CONVERTERS are available for all Link-Belt Speeder models, supply power to match the load . . . provide sustained power, increased line pull to maintain high production even with heavy loads and to handle these big loads smoothly, accurately!

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LINK-BELT SPEEDER

Builders of a complete line of shovel-cranes . . . with exclusive Speed-o-Matic power hydraulic controls

In the three tubes under the Hudson . . .

Traffic Control Ends Tunnel Congestion

An entirely new coordinated three-tube traffic control system was installed and put into operation on May 25, with the opening of the Lincoln Tunnel's $100 million Third Tube. (ENR May 30, p. 21) According to the Port of New York Authority, the $8 million that went for electrical installations was well spent.

Among the results:

• On May 26, the first full day of three-tube operation, backups under peak traffic load were non-existent for the first time in several years, and 66,367 vehicles passed through the tunnel.

• Uninterrupted movement and reduced traffic density in three-tube operation have reduced stoppages that occur as a result of overheated motors and vapor lock.

• The reduction in stoppages also has appreciably cut cost of electric power for tunnel operation. Ventilating fans have been operated at slower speeds since the opening of the third tube but still provide sufficient ventilation to keep carbon monoxide content down to the specified 2½ parts per 10,000 during traffic peaks.

• **Credit to controls**—These advantages can be ascribed, in part, to the new push-button control system that co-ordinates traffic control in the three tubes. The control provides smooth change-over of traffic directions in the center tube (which is operated with both lanes carrying traffic eastward or westward, or one lane in each direction). The new traffic control includes not only automatic setting of traffic lights but the automatic changing of an appreciable number of approach signs.

Changes in traffic signals, when stoppages occur, are initiated by policemen located at six stations in each tube. By push-button they reset traffic signals and thus can clear one lane of traffic for emergency vehicles that may be summoned. When the emergency is cleared normal operation is restored.

• **Master board**—Changes initiated by the policemen are indicated on a master control board, studded with lights corresponding to the actual traffic signals in the tubes. The attendant adjusts the ventilation fan speed to conform with changed tube atmosphere that may be due, for example, to bunched traffic. As a safety measure continuous recording of carbon monoxide content of the air in the tubes is made at the master control board.

Request for emergency equipment—which may be a jeep, a tractor or a fire truck—is indicated on an annunciator board in the tunnel garage and by an audible signal. The required equipment is rushed to the breakdown scene via the cleared lane while the other lane is used to move delayed tunnel traffic. An exception to this procedure is the rare instance of fire, in which the slow-lane traffic movement is controlled by flashing amber lights.

Electric power for operation of the third tube is supplied by substations at both ends, similar to those used for the first and second tubes. They are double-ended and fed from New York by Consolidated Edison at 13.2 kv and from New Jersey by Public Service at 4.16 kv. With the addition of the third tube, six substations are available. The 460 volt output is tied together to permit drawing from either or both utilities with load on one to six units.

• **Warning devices**—In addition to traffic control, automatic electric eye scanning warns of truck heights in excess of the tunnel's 13 ft clearances. When clearance is exceeded, the photo-electric device automatically switches traffic signals and initiates audible warning signals in the plazas.

Protection of the public is further assured by an automatic telephone check of the supervisor of the control center. At intervals of a few minutes he must answer a phone call to check his presence. If he fails to answer or is slow in doing so, police are rushed to the scene to make sure there are no interruptions in the vital tunnel operation, due to illness or death.

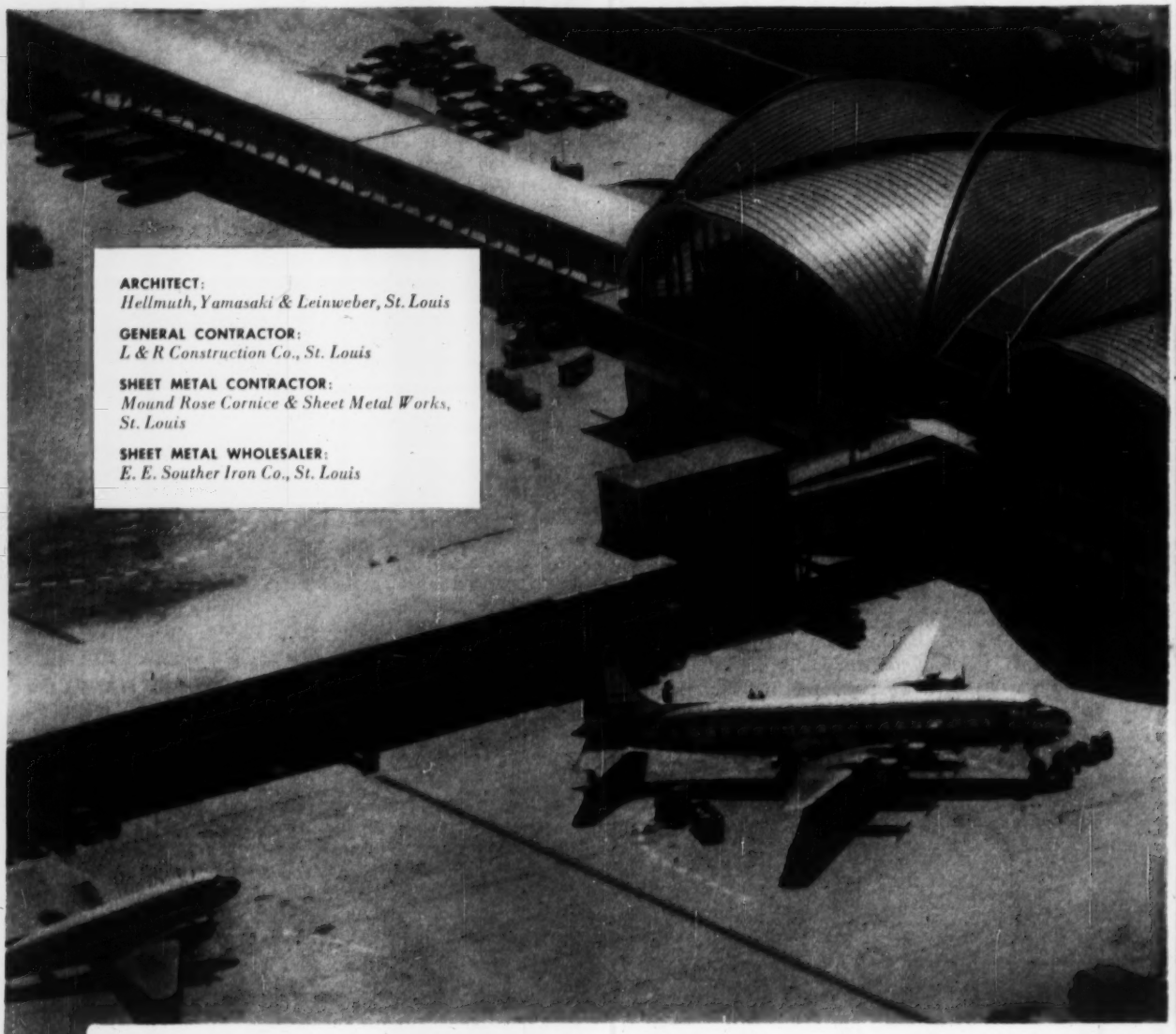
Since three-tube operations began, increased efficiency has been reflected in lower power demand and an average use of only 60% of substation capacity. Tie-in bus and circuit breakers have also permitted adjustment of tunnel demand to ease the available supply of power from the two utilities. For example, during a heat wave in June, Consolidated Edison was loaded to capacity. Total tunnel load was temporarily put on Public Service, which had available capacity. Similarly tie-in switching facilitates maximum use of off-peak power from both sources.

Transformers and air circuit breakers produced by Federal Pacific Electric Co., were installed by Fischbach & Moore and Lightning Electric Service.

EMERGENCY CALLS, originating from policemen at any of the six lanes in the three tunnels, are routed automatically to one of the control panels at either end.

CONTROL BOARD SHOWS the existing circuit conditions with colored indication bullseyes, nameplates, meter dials, and breaker position switches.

It's Chase® copper for new



ARCHITECT:
Hellmuth, Yamasaki & Leinweber, St. Louis

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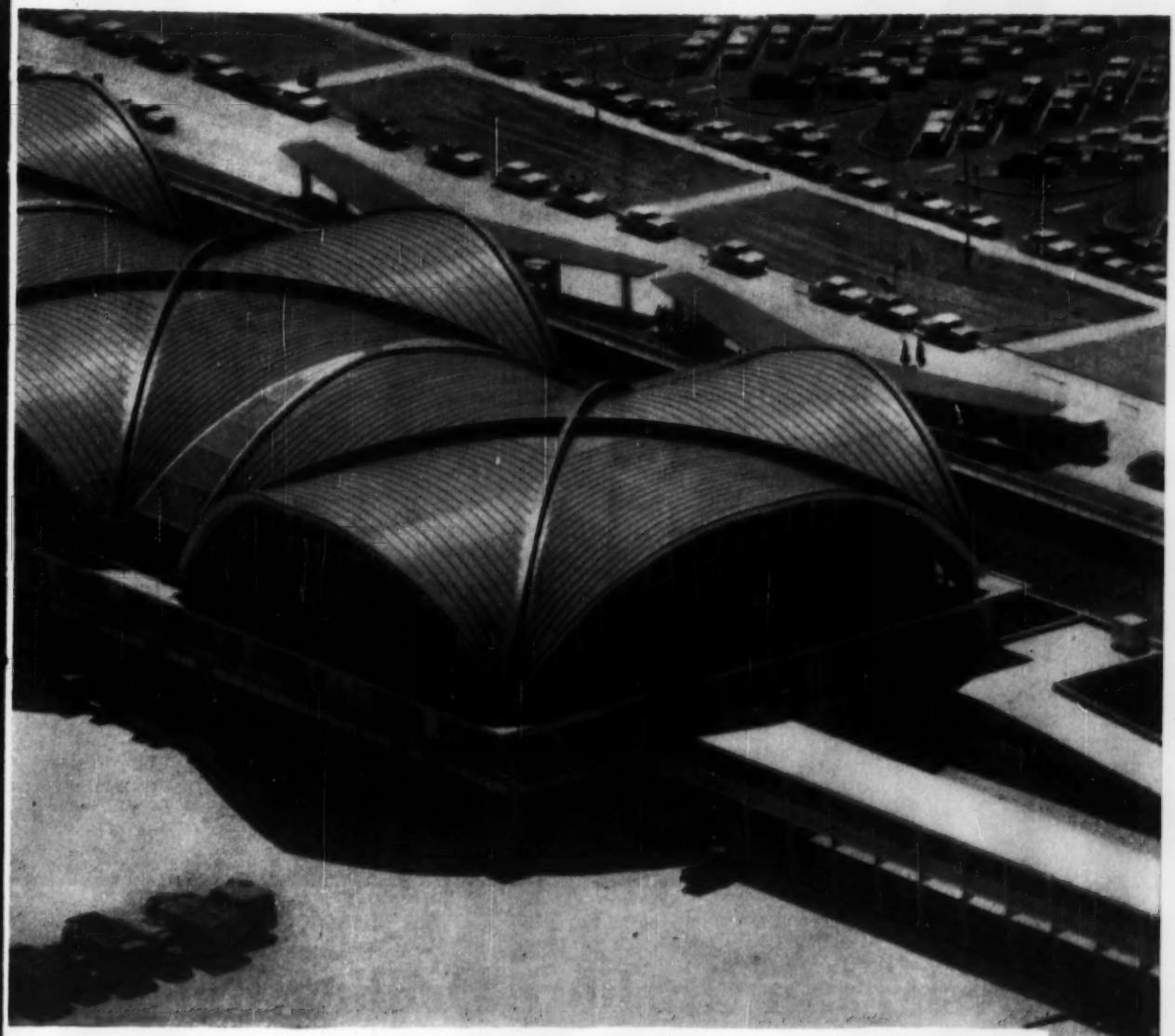

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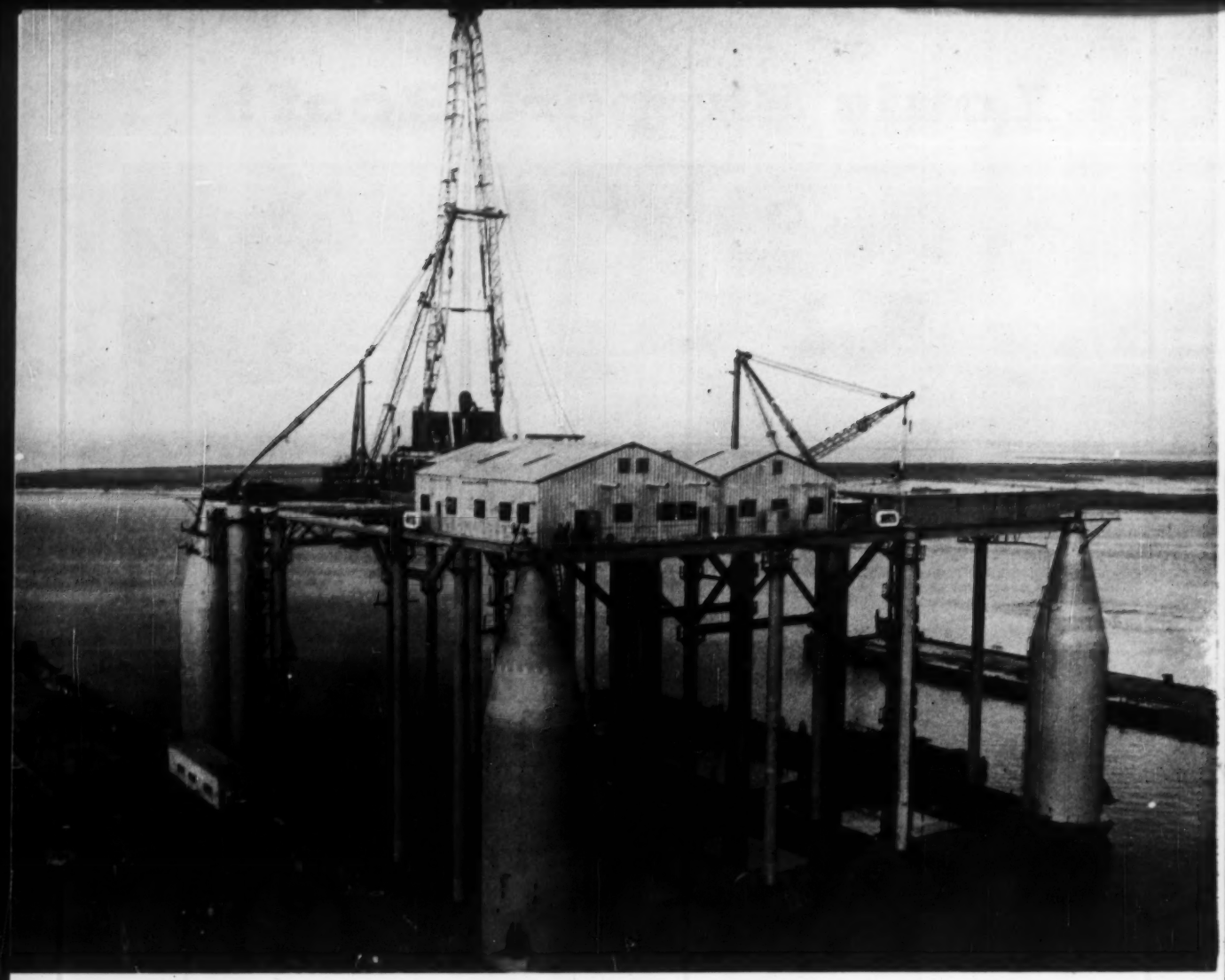


Second of two articles describes . . .

New Designs in Offshore Drilling Rigs

J. Roland Carr
Associate Editor

Neither the threat of hurricanes nor the destructive forces of wind and waves are insurmountable barriers to offshore drilling for oil and gas in the Gulf of Mexico. Although Hurricane Audrey did substantial damage to some drilling rigs and tenders last June, a surprising number came through the storm with little or no damage.

For one thing, engineers and marine contractors in this segment of the construction industry believe they can design and build drilling platforms capable of operating under almost any conditions, short of a hurricane. Moreover, the rush to develop new fields by drilling farther offshore and in deeper water calls for bold designs to cope with a variety of conditions.

One measure of the tremendous activity in offshore drilling this season is indicated by the fact that over 110 drilling rigs are currently in operation in the Gulf of Mexico. Most of the drilling rigs, which include both fixed and mobile types, are working off the coast of Louisiana.

Mobile drilling platforms are in considerable demand, for both exploratory and development drilling. Of 20 such rigs recently announced or now being constructed, four are designed to operate in water depths up to 100 ft. One rig is designed to drill in a maximum water depth of 140 ft; 10 will operate in maximum depth of 60 to 80 ft; and five in 30 to 50 ft of water.

The three basic types of offshore drilling rigs—mobile, self-contained and tender types—were described in a previous article (ENR Oct. 3, p. 54), which also presented current design and construction practices of Brown & Root, Houston, Texas.

To present a cross-section of present and future developments in the challenging field of offshore drilling, here are brief descriptions of advanced designs and construction innovations of some more of those firms engaged in designing, fabricating, erecting or operating offshore drilling rigs:

Magnolia's Design

The Magnolia Petroleum Company—as operator for the Magnolia-Conti-

GIANT SUBMERSIBLE drilling rig of Kerr-McGee mounts power house, drilling equipment, 50 man crew quarters and heliport on 230x180 ft "Texas deck" 100 ft above base of welded tubular barge hull to permit drilling in 70 ft of water. Bottle-shaped 20-ft dia columns at the four corners give added stability.

nental-Newmont enterprise off the Louisiana coast—designs its offshore drilling platforms and fabricates most of them in a fabricating yard at Morgan City, La. They are assembled from conventional stock items of pipe and structural steel.

It takes from 30 to 45 days to fabricate a platform and get everything ready for erection. Erection at the location takes from 7 to 18 days, depending on the weather.

The platforms are fabricated in three basic units: the templet, or substructure; the superstructure, or deck; and the piling. This permits on-the-job assembly and erection by handling a minimum of sub-assemblies or construction units—all within the capacity of 250 ton erection cranes.

• **Hurricane design**—Since the drilling rigs are designed for operation in the Gulf of Mexico, it is only prudent that both the drilling derrick and the drilling structure itself are designed for a 125 mph hurricane wind.

Wind forces are calculated according to the American Petroleum Institute's formula: $P = 0.004\ V^2$ where, P is wind pressure measured in lb per sq ft, and V is wind velocity measured in mph. Thus, for a 125 mph wind, the wind pressure is 62.5 psf on a plane vertical surface, or roughly twice that used in conventional bridge and structure design.

• **Wave pressures**—The design of Magnolia's offshore drilling platforms against wave conditions is based largely on deductions revealed in recorded observations and tests performed in Oceanographic Laboratory test tanks.

For design purposes, a 32 ft wave crest above mean low tide in 40 ft of water is assumed. Similarly, the maximum pressure at the crest of a breaking wave is assumed to be 500 psf on a plane vertical surface. The maximum wave heights to be expected, and the resulting crest pressures, are reduced, however, where shallower water is encountered.

• **Vertical loads**—In addition to wind and wave forces, the structures are designed for actual dead and live loads plus an impact factor of 100% of the weight of a moving load. In the absence of heavier load concentrations, the open areas of the platform deck are designed for a live load of 1,000 psf.

Unit stresses are calculated on the basis of recommended AISC allowables, with a 33⅓% increase when using load totals that include 100% impact either with or without wind and wave loads.

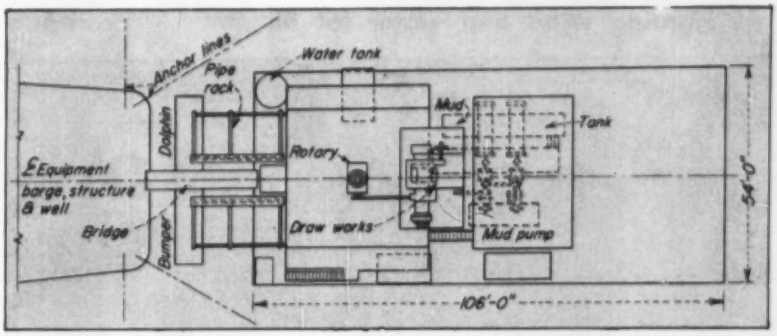
• **Pile pressures**—In designing piling the general rule of Magnolia's design engineers is to limit the maximum operating load on any one supporting pile to 600 psf of pile surface below the ocean bottom. This is based on spot tests performed at different locations and is used in the absence of a test pile at a specific location.

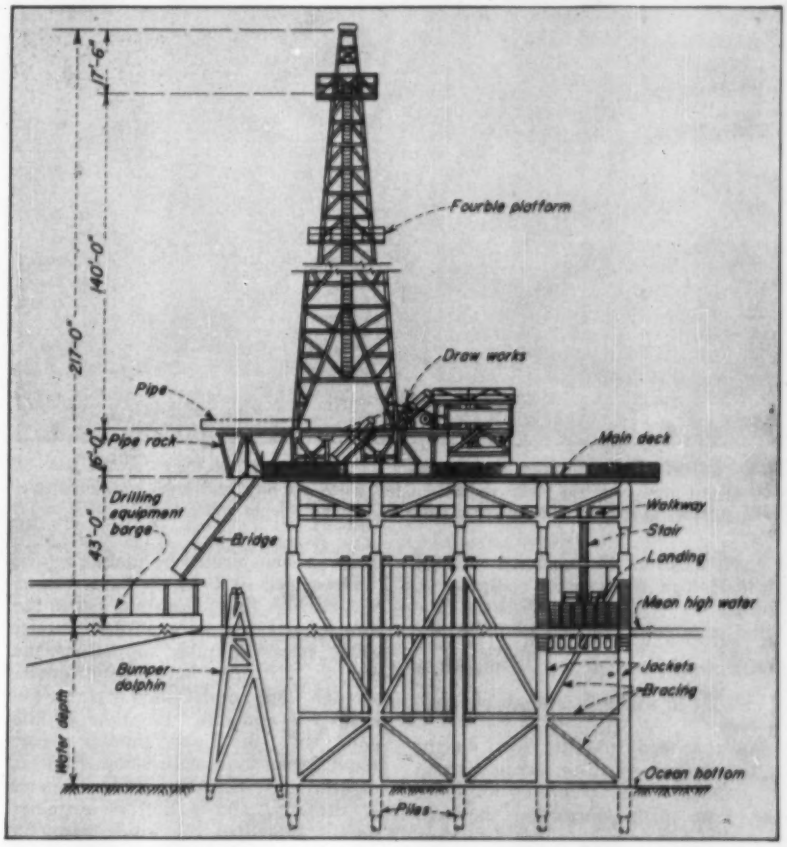
In general, the dynamic resistance of a pile is determined from the modified Engineering News Formula:

$$R = \frac{2WH}{S + P/10W}$$ where:

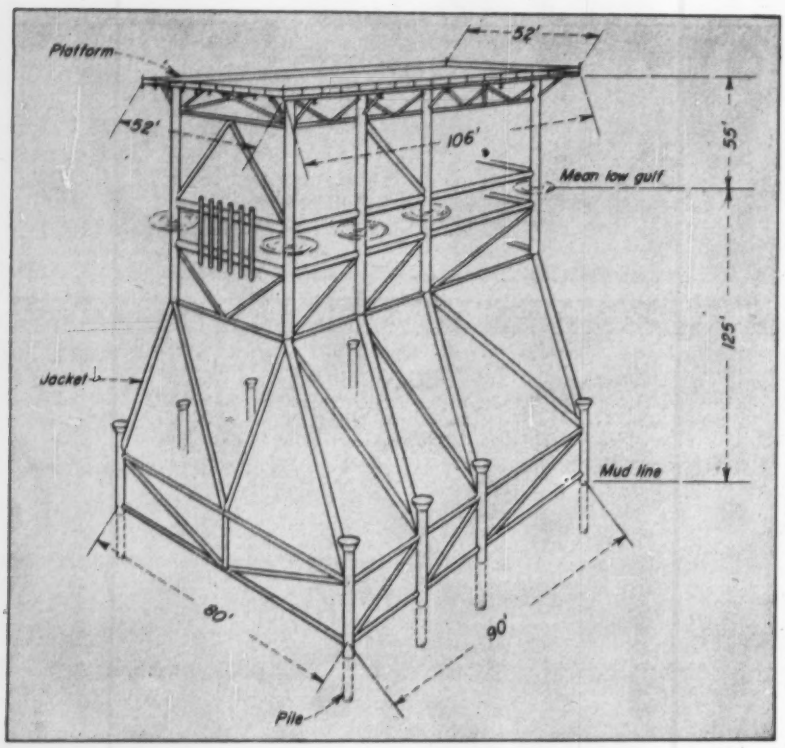
R = dynamic resistance, in tons
W = weight of ram, in tons
H = height of fall, in feet
S = penetration per blow, in inches
P = weight of pile, in tons.

In the absence of a static load at





MAGNOLIA PETROLEUM CO. drilling platform, served by tender barge securely anchored on centerline (at top) and equipped with pipe racks, draw works and other drilling machinery, has main deck located 43 ft above high water (at bottom) to clear 40 ft waves in severe storms.



PILE-TO-JACKET connection developed by Fares Hanna & Associates permit base of streamlined fixed platform to be spread out for added stability, and saves additional steel in deep water by eliminating pile extensions from mud line to water level.

a given location, the assumed ratio of ultimate load to dynamic resistance is limited to 5:1. Allowable loads are based on a safety factor of 1.5:1 where the allowable load, $L = \frac{5R}{1.5}$ or, where $R = 0.3L$, in which L = allowable load, in tons.

As a general rule the total height of the drilling rig, from ocean bottom to platform deck is limited to twice the least plan dimension between centerlines of outside piling. Pile spacing is usually held to a maximum of 12 times the pile diameter.

Protecting these offshore rigs against corrosion is a serious problem. Magnolia Petroleum Co. does it in three ways: By applying a six-coat vinyl plastic paint to the structure above water line; by using Monel sheathing in the tide zone from 2 ft below, to 6 ft above, mean low tide; and by using a system of magnesium anodes attached to the structure.

Hanna's Design

One design concept that offers considerable savings in the construction of fixed drilling platforms is the so called jacket-to-pile connection. It has been used in designing protective structures for wells drilled by mobile rigs.

Developed in 1955 by Fares Hanna & Associates, Inc., Houston, Texas, the connection is accomplished under water after the piles supporting the drilling platform have been driven through the tubular members of the jacket, or template. Keystone of the joint is a machined tubular swage about 24 in. long, with a top diameter slightly larger than the inside diameter of the pile, and a bottom diameter slightly less than the inside diameter of the pile.

After a pile has been driven to a predetermined depth through the jacket leg, using a follower and pile-driving hammer, the follower is withdrawn and the swage is seated in the top of the pile. A mandrel, placed on the lower end of the follower, then forces the swage into the top of the pile. As the pile is thus expanded circumferentially it is forced into positive contact with a "toothed" circular ring about 18 in. long welded to the inner surface of the jacket leg. This completes the pile-to-jacket connection.

Considerable saving in steel is possible by using this design concept. The biggest saving is the cost of pile extensions from mud line to the top of jacket, since the piles are cut off just above the mudline. A second substanial saving results from eliminating the need for thickening the walls, above and below the mud line, of piling supporting conventional drilling platforms. Instead, the swaged-type connection, in effect, thickens the combined column and jacket to resist bending moment and shear.

In conventional platforms the thickening of the walls of the supporting columns can be quite a problem. Since it is difficult to estimate the amount of penetration and just where the mud line will strike the pile. For example, a 30 in. pile with a normal $\frac{3}{8}$ in. wall thickness might have to be thickened to $1\frac{1}{4}$ in. for a distance of 30 or 40 ft below mud line to a few feet above mud line.

One of the first applications made by Hanna of this pile-to-jacket connection was for a tender-type drilling platform operating in 100 ft of water. The design permitted spreading the base of the jacket for stability, while keeping the remainder of the structure from mud line to above water line slender and within reasonable proportions. This slimmer structure reduced the wave forces and saved additional tonnage of steel. A second design was for a self-contained platform for a 125 ft depth.

The Kermac Rig

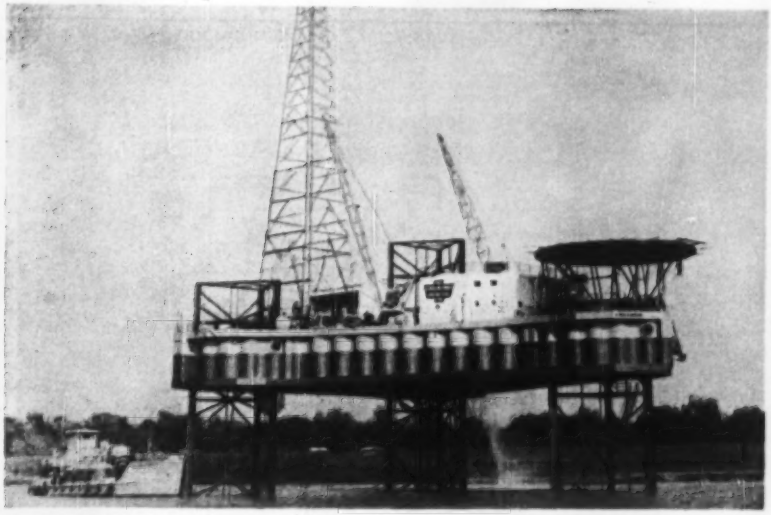
In the field of mobile offshore drilling rigs are two giant submersibles—Kermac Rig 46 commissioned last October and Kermac Rig 47 completed this spring—owned and operated by Kerr-McGee Oil Industries, Inc. They are of the same design and can drill in 70 ft of water.

Buoyance needed to float Rig 47 is secured by a grid pattern of $14\frac{1}{2}$ ft dia tubular members that form the barge hull. Stability is obtained by the tremendous size of the rig which has overall dimensions of 242 by 202 ft; its weight-on-bottom of 5,000 tons; and four big "bottle-shaped" stabilizing columns on the corners. It is lowered to the ocean floor by flooding the hull cylinders.

• **Big stabilizers**—The stabilizing columns are 100 ft tall. The lower 64 ft of column is 20 ft dia, tapering to 5 ft dia at the top. Working level of the rig is 100 ft above the barge base line. It is a 180x230 ft T-shaped "Texas deck" supported by twenty 42 in. dia and two 48 in. dia tubular steel columns extending up from the tubular barge hull.

Air conditioned crew quarters for 50 men are located in a 60x65 ft area at the opposite end of the deck from the drilling equipment. There is a galley with walk-in cooler and deep-freeze, dining and recreation rooms,

. . . Fighting wind and waves for oil



THREE LEGGED drilling rig, "Vinegarroon," of Zapata Off-Shore Co., can drill 20,000 ft deep wells in 100 ft of water. Completely self-contained double deck platform can be raised or lowered at a rate of 16 in. per min.

office and radio room. The roof of the building is used as a heliport.

• **Double-duty mast**—One innovation of Kermac Rig 47, which represents a new principle in drilling barge design, is its 150 ft full-view drilling mat which also doubles as a constructon boom of 125 ton capacity for setting protection and production platforms. It is seated on a movable platform cantilevered 55 ft beyond the edge of the deck. This movable structure permits six wells to be drilled without moving the barge. It is designed for 130 mph winds.

Power for the rig—enough to serve a town of 6,000 population—is supplied by three 875 hp diesel engines each driving two 500 kw dc generators. In addition, two 500 hp engines each drive a 350 kw 400 v ac auxiliary generator.

Material handling equipment includes two stiffleg derricks with 105 ft maximum reach and a fork-lift truck for handling materials in the enclosed areas.

• **Offshore drilling pioneer**—Kerr-McGee is one of the pioneers in offshore development in the Gulf of Mexico and perhaps is the leading firm drilling wells on contract for others. It also drills on its own extensive holdings offshore from Louisiana.

In 1947, the company made oil industry history by drilling the first discovery well out of sight of land in the unprotected waters of the Gulf of Mexico. A minimum platform and tender vessel—a converted barge—was used.

Three years later Kerr-McGee pioneered the use of submersible barge for offshore drilling, with its Rig 40, in contract drilling off the Texas Gulf Coast.

Currently the company is running nine offshore drilling rigs, of which four are minimum platform with tender, and others are submersible. A tenth rig, Kermac Rig 49 will be a smaller version of Rig 47, designed to operate in waters up to 45 ft in depth.

"Mr. Gus No. 2"

The largest mobile drilling platform is owned by the C. G. Glasscock Drilling Co., of Corpus Christi, Texas. Named "Mr. Gus No. 2," it is designed to drill in 125 ft of water during the hurricane season; otherwise in 140 ft maximum depth.

Support for the giant rig is provided by an all-welded U-shaped mat 200 ft long, 180 ft wide and 10 ft deep, with a 3 ft anti-scour skirt on all four sides.

Four 10 ft dia steel plate columns extend up from the mat to carry a double deck platform measuring 268 ft long, 140 ft wide and 22 ft deep. Directly beneath each corner column is a 7 ft dia eccentric tubular pile that extends down into the ocean bed a maximum of 67 ft for lateral anchorage. The mat sets on the bottom and furnishes the vertical support.

During drilling operations the platform is 55 ft above water, to accommodate 40 ft waves. It measures 225 ft from bottom of mat to top of working deck, while the drilling derrick extends on up another 140 ft.

To move from one location to another, the deck structure is first lowered to a floating position in the water. Spud anchor piles are retracted and the mat is picked up off the bottom of the ocean to a submerged position below the deck, and the platform is ready for towing by tow boats.

Four big hydraulic jacks raise and lower the deck, mat and spud anchor piling. Each jack has six 20 in. dia cylinders, which operate under maximum pressure of 3,000 psi.

The movable derrick permits drilling six wells at one location. The diesel electric power plant generates 5,000 kw of dc power, plus 900 kw of ac auxiliary power. Air conditioned quarters are provided for 64 men.

Mr. Gus No. 2 carries two 75 ton stiffleg derricks with 100 ft booms, chiefly to erect well-protection structures, and two 25 ton revolving cranes to handle materials and personnel.

One noteworthy advantage of the big 200x180x10 ft welded steel mat is its ability to preconsolidate a drilling area to guard against unequal settlement during drilling. By flooding nine compartments in the mat a total weight of 2.5 million lb can be applied to the ocean bed.

The platform is also designed for drilling two wells at a time. In fact, since "time is the most expensive commodity on the job," say the Glasscock engineers, "as much of the operating machinery as feasible is installed in duplicate to eliminate the chance of mechanical failure."

"Ed Malloy"

Some drilling platforms incorporate the floating dry dock principle. One such rig, the "Ed Malloy," owned by John W. Mecom is designed to drill in 10 to 40 ft of water. Its 1,400 ton seagoing drydock is 220 ft long, 78 ft wide with 48 ft high wing walls. It is built of heavy steel, with $\frac{7}{16}$ in. bottom plates.

The entire drilling rig cost about $2 million. The drilling barge cost about $800,000; the barge-supporting drydock, about $800,000; and the remainder included tugs and auxiliary craft. It has living quarters for a 24 man crew and can drill to depths of 16,000 ft.

Zapata's Rigs

A pair of self-contained mobile drilling platforms, owned by Zapata Off-Shore Co., have a number of unique features. The first one was christened the "Scorpion" in March of last year. The other one is the "Vinegarroon" completed last March.

Both platforms are based on a three-legged design, with each leg made up of three heavy vertical tubular steel

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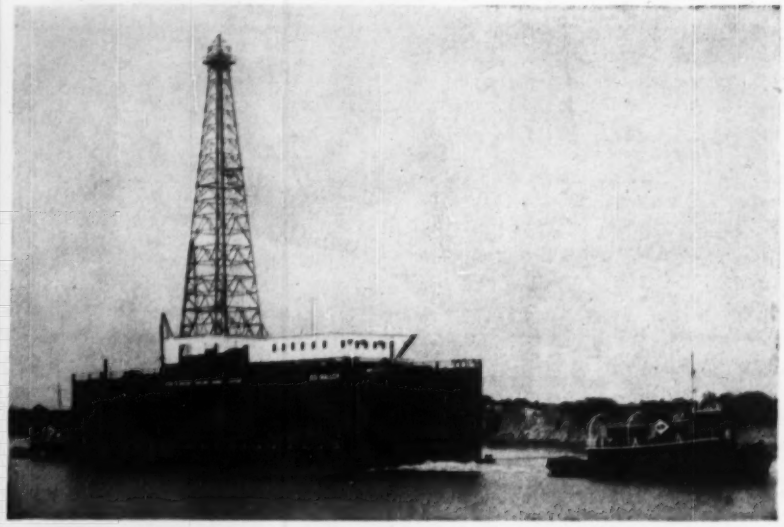

FLOATING DRY DOCK type of offshore drilling rig, the "Ed Malloy" owned by John W. Mecom, can drill 15,000 ft wells in 40 ft of water.

members securely cross-braced together. The decks are raised above water for drilling, and lowered to provide buoyancy when being towed to a new location, by electrically-driven gears and pinions.

The Vinegarroon is the larger of the two rigs. Built and outfitted at a cost of $3.25 million, its legs are 145 ft high to permit drilling in 100 ft of water, with 45 ft of freeboard.

Large spud tanks 35 ft in dia and 32 ft high, forming the feet of the three legs, are filled with water as the legs are lowered. With their concave bottoms they grip the ocean bottom to give anchorage during drilling.

Nine electric motors in each of the three spud housings drive the legs through 6,000 to 1 gear reductions to raise the drilling platform at the rate of 16 in. per min.

• **Diesel-electric power**—Power for raising and lowering the platforms, and for miscellaneous services is furnished by three 600 hp turbocharged disel engines.

Prime diesel power for drilling is provided by four 520 hp engines.

The Vinegarroon's double deck platform measures 176x151x20 ft deep, with a loaded draft of 11.5 ft. It mounts a 140 drilling derrick with complete drilling equipment, two 80 ft boom revolving cranes, and three 50,000 lb line-pull anchor winches to position and moor the platform.

Air conditioned quarters and living facilities are provided for a 45 man crew. A heliport is located at one corner of the platform. And the communication system includes short wave and ship-to-shore telephone, together with an intercommunication system connecting key points on the rig with the control office at the center.

Still Other Designs

In most cases there are great differences in design and operation of mobile platforms between the different companies. In some cases, however, there is considerable similarity.

For example, a new mobile platform being fabricated for Brewster-Bartle Drilling Co. Inc., at Pascagoula, Miss., will be almost identical with Kerr-McGee's Rig 46; the chief difference being that it stands 10 ft higher out of the water. Measuring 110 ft from base of barge hull to top of Texas deck, it is designed to drill in 80 ft of water compared to a water-depth of 70 ft for the Kermac 46.

Three mobile drilling rigs being fabricated by R. G. LeTourneau, Inc., Longview, Texas, are similar in design to Zapata's "Vinegarroon."

Not all of the oil-producing companies in the Gulf believe in drilling their own offshore wells. Some prefer to contract the work, either on a lump sum basis or a price per lineal foot.

One company says it contracts its wells chiefly on account of the tax situation, since the cost of drilling can be recorded as operating expense. On the other hand, to build an expensive drilling platform represents an investment of several million dollars, which must be amortized.

Exploratory wells are usually quite expensive. Chances are about 9 to 1 of getting a dry hole in some areas of the Gulf. Yet the rewards are sufficient to keep exploratory and development drilling going full speed for a number of years.

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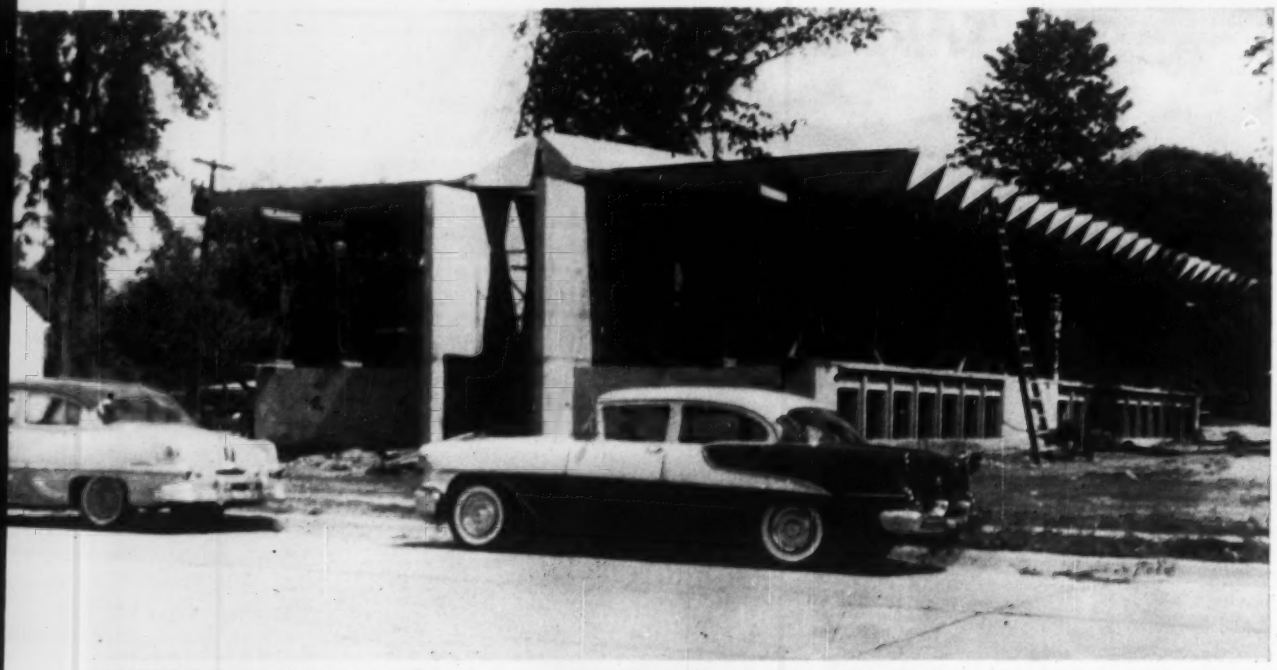
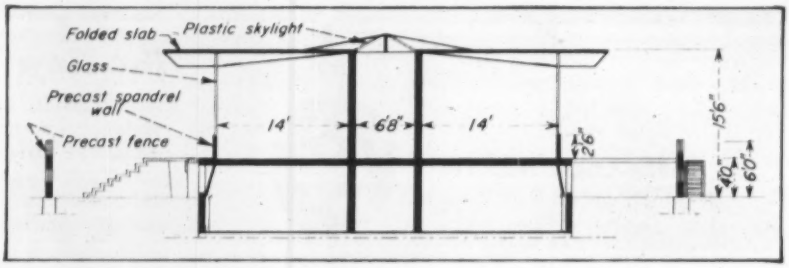
Home office and concrete showpiece: The double role seems well within the capabilities of the American Concrete Institute's new building in Detroit

Folded-Plate



FOLDED SLABS each form a trough at the eave, a gable at the corridor. Double-cantilever continuity was achieved by welding at center.



Several weeks of construction remain yet before the American Concrete Institute's new home in Detroit will be ready for occupancy by the headquarters staff. But already the building is functioning in an important secondary capacity—that of being a showpiece of concrete construction.

It goes almost without saying that the ACI specified reinforced concrete for its home office building. But institute officials also wanted something more—imaginative use of the material. That end is strikingly achieved in the design of Yamasaki, Leinweber & Associates, architects, Royal Oak, Mich.

• **Eye-catching appearance**—Although the building is small—38 x 91 ft, one story and basement—it has an arresting appearance, with chief interest centered in its double-cantilever, folded-slab roof.

Additional visual interest—not to mention privacy—will be provided by concrete openwork. A 6 ft high fence of hexagonal concrete block, laid with voids vertical and with spaces between adjacent units, will surround the entire building. Concrete lattices will shield the basement windows. And a 12 in. thick barrier made of concrete pipes, laid with bores through the barrier thickness, will screen the glass walls at each end of the building.

White will be the predominant exterior color of the building, with most exposed concrete painted that color and the roof slabs spray-coated with white vinyl roofing.

• **Replaces rented quarters**—The new building will be the ACI's first home of its own. Headquarters operations are presently cramped into a rented one-story building elsewhere in Detroit.

The new quarters will have about 7,000 sq ft of space, divided between the two floors. The main floor will accommodate a working force up to 23 persons. Basement facilities will include a library and conference room, mail room, utilities, storage space, and an isolated area for noisy office machinery.

The project will cost $250,000, plus land and improvements. Fund raising is still in progress, under the direction of an ACI committee initially headed by the late Henry L. Kennedy.

• **Roof design**—The roof consists of thin-shell concrete folded slabs, with the creases oriented across the building. Supported only on the walls of a central corridor, the slabs cantilever about 19 ft on either side. This places the cantilever tips 4 ft beyond the line of the basement walls and first floor.

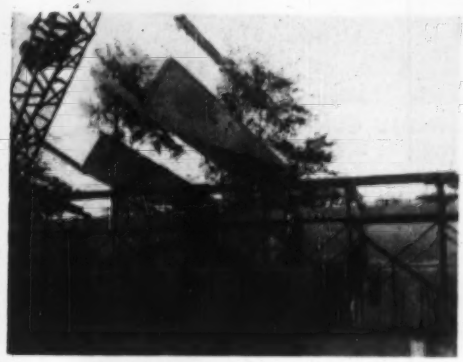
The shape of the slabs is such that both the eave elevation on a long side of the building, and a vertical section through the roof along the corridor wall are deeply serrated or gabled. But peaks and valleys at the corridor do not corre-

Cantilevers Roof New ACI Headquarters

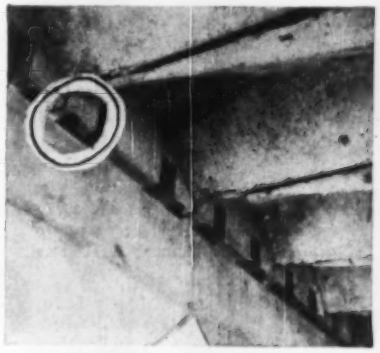
8 am first day
PRECASTING CYCLE BEGAN every 1½ days for each of three sets of roof-slab forms.

8 am second day
STRIPPED AFTER 24 HR. slab is shown here inverted, with eave end in foreground.

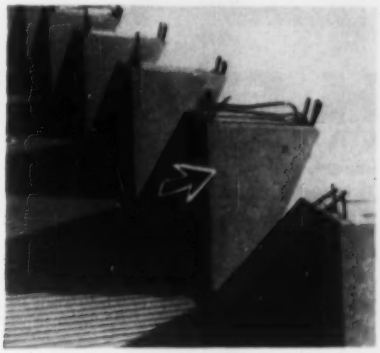
Noon second day
HALF DAY LATER, form is ready for next pour. Steel was preassembled on a jig.



SLAB ERECTION required shoring to free end. Photos at right show other end . . .



. . . FROM OFFICE SIDE: Diaphragm bears on short I-beam sections.



. . . FROM CORRIDOR: Webs (arrow) add depth in most highly stressed regions.

spond to those at the eave. Instead, within the half-width of the building (the length of a slab), there is a reversal of the creases, so that peaks and valleys at the corridor correspond to valleys and peaks, respectively, at the eave.

The corridor ends of the slabs are fashioned with monolithically cast vertical webs and diaphragms that give the members considerable depth, needed in this region because of high negative moments. But, viewed in plan, each slab comes almost to a point above the center of the corridor. Thus, between these wedge-shaped ends are diamond-shaped openings, which will be closed with tinted plastic skylights.

Peak-to-peak of the gables (one slab width) is 4 ft 4 in. Rise of the gables is 2 ft 0¼ in. at the eave. Slab thickness varies from 1½ in. up.

The roof contains a total of 48 slabs—44 of the same kind and 4 modified for the ends of the building. Each pair of slabs comprises a complete span across the building and, accordingly, the center connections were welded and grouted above the corridor after erection to make the two slabs fully continuous.

• **Walls and floors**—The basement is of conventional construction, with cast-in-place floor slab and walls, including corridor walls. The corridor walls extend up through the main story also, to support the cantilever roof slabs.

The main floor consists of hollow precast concrete slabs—except for the corridor floor, which is cast-in-place. Core voids serve as heating and ventilating ducts and electric cable raceways.

Outside walls of the main story will be floor-to-roof aluminum sash, with 1½ in. precast concrete panels inserted for a 30 in. height at the bottom, and glass installed in the remaining height. The top of the glass will follow the sawtooth profile of the roof slabs.

Floors will be finished with asphalt tile. Concrete walls will be painted and left exposed. Decorative flutes were cast into extensive wall areas.

Outside the glass-wall line, the underside of the roof slabs will be painted and left exposed. Inside, 1 in. of rigid glass-fiber insulation will be applied, and the slabs will be furred out ¾ in. and covered with metal lath and plaster.

A combination of forced warm-air and radiant heating will be used. Warm air will flow to registers via a circuitous route through the core voids of the floor slabs and, thus, will heat the slabs.

• **Precast roof slabs**—Using three sets of plastic-coated plywood forms, the general contractor—Pulte-Strang, Inc., Ferndale, Mich.—precast the folded roof slabs on the site at the rate of two a day. The typical cycle for a set of forms took a day and a half and ran as follows:

1. 8 am first day—placed concrete;
2. 8 am second day—lifted slab from forms;
3. Noon second day—forms ready for next pour.

The contractor fabricated the reinforcing cages on the job, using a dummy form as a jig. Assembled completely this way, all reinforcement for each slab was placed in the form as a unit.

Before erecting any of the roof slabs, the contractor cast the 44 of a kind. Then he altered the forms for the four special end slabs and at the same time began erecting the completed units.

• **Erection**—To shore up the cantilever

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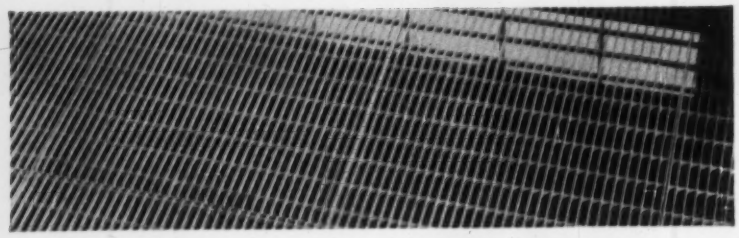

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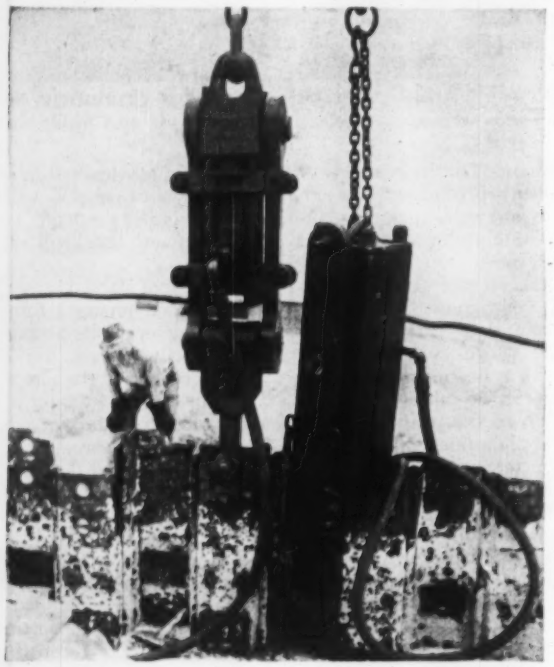

Pile-pulling partners: McKiernan-Terry No. 6 Double-Acting Pile Hammer and E2 Double-Acting Pile Extractor working alongside each other in moving a sea wall closer to the water edge to make room for beach cabins at Miami, Fla. Each sheet pile was first driven down by the hammer to break the bond with the adjacent one which was then pulled out by the extractor. McKiernan-Terry Corporation, 80A Richards Ave., Dover, N. J.

. . . Folded-plate panels

WELDED CONNECTIONS join adjacent roof slabs to one another.

ends of the slabs during erection, the contractor installed steel scaffolding on the first floor. Support for each slab at the corridor wall consisted of two short lengths of I beam laid across the wall. The slabs were positioned with the corridor ends of each pair a few inches apart, steel reinforcement projecting from the ends into the spaces. Along the sides of each slab was a 3 x $\frac{3}{8}$ in. plate, anchored in the concrete edge by means of dowels welded to the plate before embedment.

After all slabs were in place, the center connections were welded and the plates along the sides were welded top and bottom with 3 in. welds 8 in. c-c (continuous in the region of the exterior glass wall). Then, using expanding cement grout (of the type containing iron filings as the expanding agent to counteract shrinkage), the contractor filled the openings at the ends and along the sides of the slabs and also the spaces between the top of the walls and the bottom of the slabs.

The sprayed on vinyl plastic will be the only finishing treatment given the roof. Over the ridges, which are the joints, sheet vinyl will be placed before spraying.

Yamasaki, Leinweber & Associates handled the mechanical and electrical design as well as the architectural design. Ammann & Whitney, of New York, was consulting structural engineer through the firm's Milwaukee, Wis., office, Robert H. Hopwood in charge. John Strang, Pulte-Strang partner, is construction superintendent.

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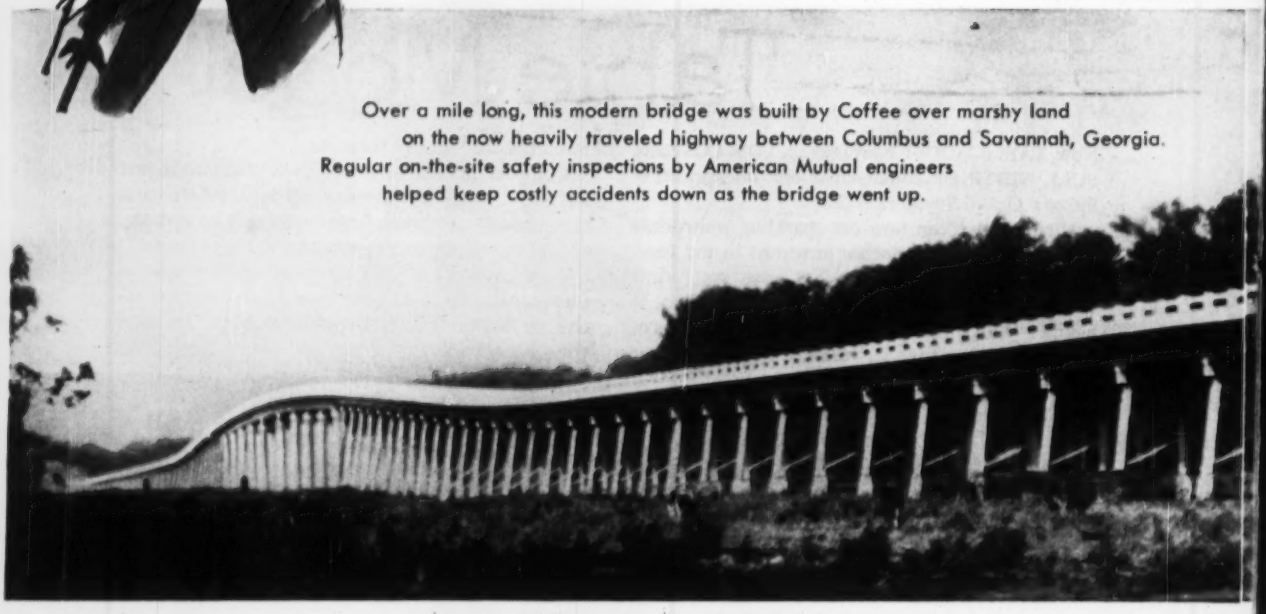

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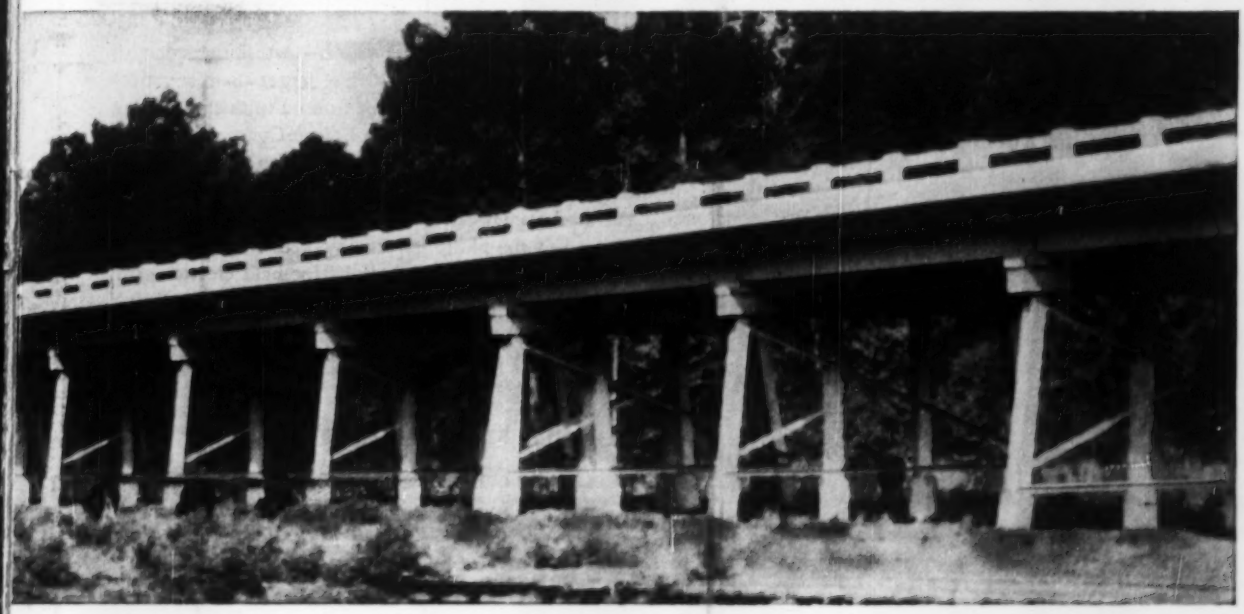
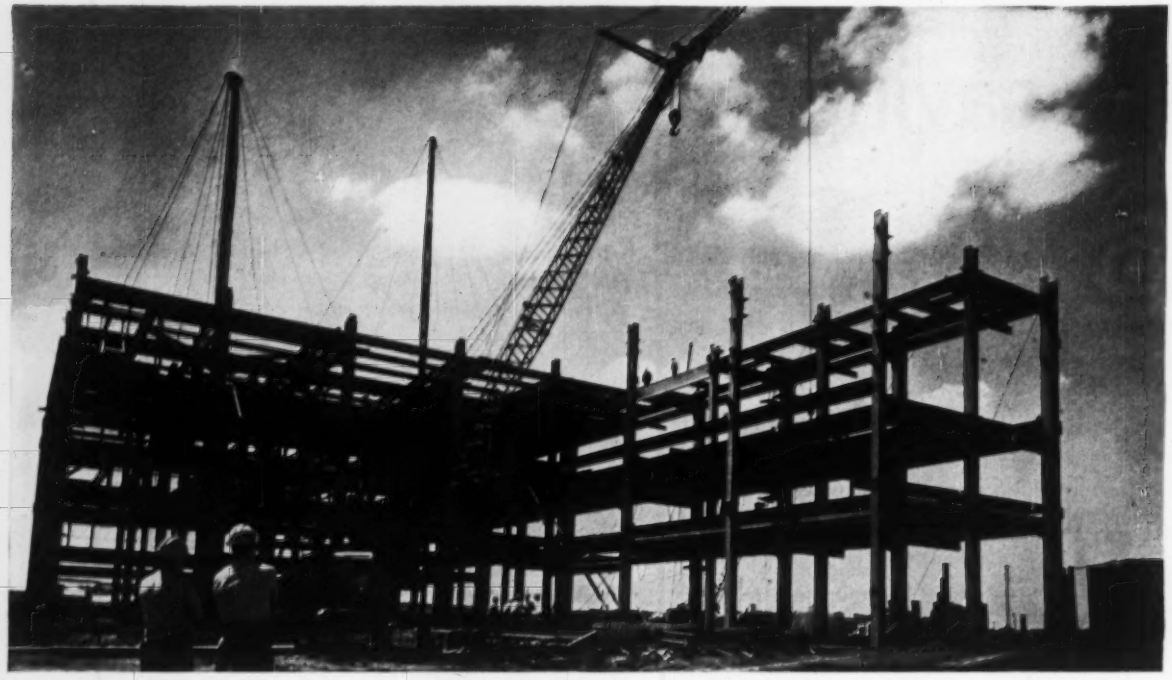
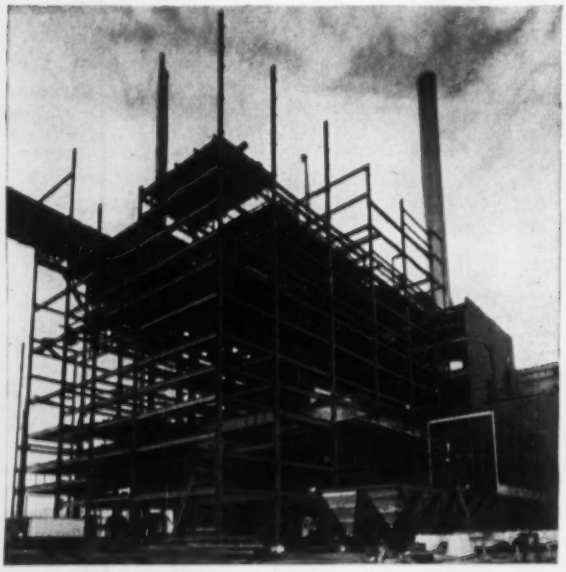


TWO NEW POWER PROJECTS



WATTS COMING AT PHIL-ELEC—Electric power industry history is being made on the banks of the Delaware River at Eddystone, a few miles south of Philadelphia. Work is well under way here with the mammoth steel framework for buildings to house the world's largest and most efficient turbine generators. These Philadelphia Electric Company units, to be operated at super-critical pressure and temperature, will produce 325,000 kilowatts each at the record-breaking rate of two-thirds of a pound of coal per kilowatt-hour.



In the photograph Bethlehem erection crews can be seen at work on the boiler house for Unit #1. They will proceed to erect steel for the huge turbine room, then begin similar work for a second generating unit of equal size. The total steel requirements will approximate 8000 tons, erected by high-strength bolting. Unit #1 is planned for operation in 1959, with Unit #2 to follow in 1960.

General contractors: United Engineers & Constructors, Inc.

EDISON ADDS A BIG ONE—A turbine generator with net capability of 305,000 kw, larger than any now in operation in the U. S., will be housed in this whopping big addition to Commonwealth Edison Company's station in Waukegan, Ill. The utility expects to place the unit into operation in summer of 1958.

The steel framework for the structure was nearing completion when the photograph was taken. Bethlehem ironworkers, using high-strength bolts for field erection, had placed much of the nearly 4000 tons of structural steel required for the job. Steel erection began Jan. 2 and was completed early in July.

Consulting engineers: Sargent & Lundy.

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EARLY WORK on one of the new highways which will open up new agricultural areas to development and thus contribute to the Ethiopian economy.

Money Makes the Roads Grow

World Bank loan of $15 million to Ethiopia gives additional impetus to that country's road program

The World Bank made a loan of $15 million last week to Ethiopia for the extension and further improvement of its highway system.

The First National City Bank of New York is participating in the loan—without the World Bank's guarantee—to the extent of $1,491,000 representing the first five maturities falling due from September 1, 1961 through September 1, 1963.

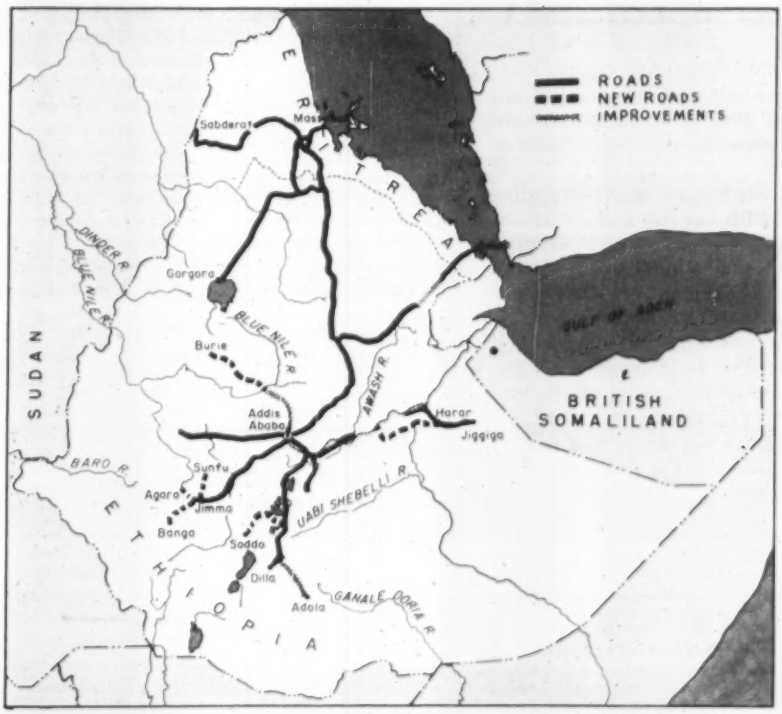
This is the second Bank loan for Ethiopian highways. A loan of $5 million in 1950 was made for rehabilitation and maintenance of the highway system. With the help of this loan and an additional investment of $20.4 million by the Ethiopian Government, a total of about 2,900 miles have been repaired and maintained. As a result there has been a 50% increase in highway traffic and a sharp drop in road and rail freight rates. This has been an important factor in the rapid expansion of Ethiapia's foreign trade—mostly in coffee and oilseeds. Over the seven years 1949-55, exports of coffee increased more than twice in volume and five times in value, and exports of oilseeds rose by 80% in volume and doubled in value.

The project now being undertaken will extend the all-weather road network to about 3,400 miles. Parts of the existing network will be further improved and six new roads with a total length of about 530 miles will be constructed. Included in the project are surveys and design of an additional 625 miles of new roads in order to permit continuance of highway development as rapidly as financial and technical resources will permit. A training program for highway personnel will also be carried on.

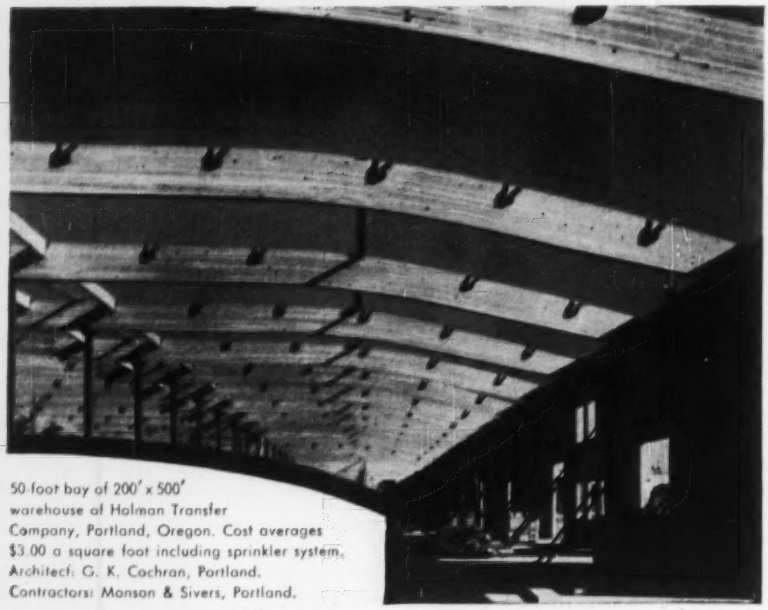
The highway program is being carried out by the Imperial Highway Authority which the Government established as an autonomous agency in 1951. The Authority has engaged two consulting firms to survey, engineer and design new roads to be built under the project, including the surveying and designing of the additional roads. The construction work will be carried out by contract under the supervision of the Authority or by the Authority itself. The road improvement portion of the project—bringing to first class condition sections of key roads which have been partially rehabilitated—will be carried out by the Authority with its own forces and equipment. It is expected that the entire project will take three to four years to complete.

The total cost of the project, including maintenance of the existing road network, is estimated at $37.8 million. The Bank's loan of $15 million will cover the foreign exchange cost of the road construction and improvements, and the surveys and designs. The major contracts for Bank-financed goods and services will be awarded on the basis of international competitive bidding. Government appropriations will cover the foreign currency cost of maintenance, plus the local currency cost of the entire project.

The loan is for a term of 20 years and bears interest of 5¾% annually in-



PRESENT ROADS are inadequate; future roads will move produce to the seaports.



50-foot bay of 200' x 500' warehouse of Holman Transfer Company, Portland, Oregon. Cost averages $3.00 a square foot including sprinkler system. Architect: G. K. Cochran, Portland. Contractors: Monson & Sivers, Portland.

low roof lines

WITH DRAINAGE OF AN ARCHED ROOF

This truly economical warehouse provides clear, moderately wide bays with the efficient roof drainage of an arched surface. But there is not an inch of waste space overhead to increase wall height or to create the expense of heating and cooling unusable space.

In consultation with Timber Structures engineers, the architect designed glulam beams with curved end members which accomplish these cost-saving results. No maintenance will be required, and resistance to destruction by fire is among the best of all unprotected materials. Cantilevered beam arrangement decreases section dimensions and lowers costs.

Other units of engineered timber construction available at Timber Structures, Inc. include arches, rigid frames, domes, trusses and columns. All are expertly laminated of dimensionally stable timber, precision fabricated for fast erection, and backed by the responsibility of the world's largest manufacturers of engineered structural timbers. For detailed information and working data, ask your nearest Timber Structures representative for the booklet "Buildings for Tomorrow", or write directly to us.

SEE OUR CATALOG IN SWEET'S INDUSTRIAL CONSTRUCTION FILE OR WRITE FOR COPY

TIMBER STRUCTURES, INC. OF CALIFORNIA
Richmond • Beverly Hills
Sacramento

TIMBER STRUCTURES, INC.
P. O. Box 3782-C, Portland 8, Oregon
Offices in Ramsey, N. J.; New York City; Boston; Philadelphia; West Hartford; Cleveland; Charlotte; Chicago; Centerline, Mich.; Kansas City; Kirkwood, Mo.; Minneapolis; Des Moines; Wichita; Memphis; Dallas; Houston; Birmingham; Seattle; Spokane; Denver.
Local Representatives throughout the United States and Canada

cluding the one percent commission which is allocated to the Bank's Special Reserve. Amortization will begin September 1, 1961.

After having been approved by the executive directors, the loan documents were signed by His Excellency Dedjazmatch Zewde Gabre Selassie, Vice Minister of Communications and Public Works and Chairman of the Imperial Highway Authority, on behalf of the Empire of Ethiopia, and by Eugene R. Black, President, on behalf of the World Bank.

Bogota Bottleneck

Columbian capital to spend milions for traffic

Bogota's Mayor Fernando Mazuera has undertaken a $24.4 million program for improvement of traffic in the city.

With its longitudinal extension along a mountain ridge, the Colombian capital has always had trouble with the north-south traffic from residential sectors to the center of the city. Bottlenecks have been difficult to overcome. And since recent westward extension of the city, the situation has become more complicated.

The new plan provides for three arteries going from east to west. The first is Calle 26, which will be the main outlet to the new International Airport to be inaugurated in 1958. This 130 ft wide avenue will cross two of the main north-south arteries under two bridges, and then will run east to the new Avenida de Los Cerros. Los Cerros is designed to follow the foot of the mountains on a level some 500 ft above the city, and thus will form an additional avenue running to the northern residential sectors.

Two other east-west avenues—Calle 19, and Calle 6, which will be known as Avenida de Los Comuneros—also are planned with a width of 130 ft.

Some $9.6 million are immediately available for the program. The rest will be collected in the form of taxes at the rate of $4 million a year.

Peru Tackles the Problem of Rebuilding Canyon Road

A highway stretch soon to be opened at Infiernillo, Peru, will eliminate a complicated figure eight curve and an 8% grade. The project is part of Peru's Central Highway, which connects Lima's port of Callao with Pucallpa.

When Central Highway was built in the 1930's, Peruvian engineers reaching Infiernillo, where sheer rock walls

tower above a narrow gorge—were forced to resort to the figure-8 development to gain altitude.

Today, the figure-8 development—with its two bridges and a gradient of up to 8%—is being replaced by a through route comprised of one bridge, two natural rock tunnels, an artificial reinforced concrete tunnel and a maximum gradient of 6%. Work, estimated to cost $400,000, is being done for the Ministry of Public Works by Cia. Constructora Andes, S. A., a Peruvian contracting firm that has been engaged for the last several years in improving and realigning the Central Highway.

The Infiernillo realignment will include a 196½ ft reinforced concrete bridge, and two natural rock tunnels that are 447 ft and 524 ft in length, lined and surfaced with concrete. The 760 ft between the two tunnels has been walled in with masonry and covered for 472 ft with reinforced concrete. Eventually, the entire distance will be covered in this manner, forming an artificial tunnel. The tunnel section will provide a double-lane highway—31 ft wide with a clearance of 21 ft—and is located 49 ft below the river bed.

Tunnel construction called for removal of some 261,000 cu yd of rock, of which all but 26,000 cu yd had to be removed from the site. Also required were 14,000 cu yd of concrete and 258,000 lb of reinforcing steel.

During the last year, $3.7 million has been spent on improvement of Central Highway, and $4.3 million more has been budgeted for further work under a five year highway plan. Elimination of the bottleneck at Infiernillo is only a small part of the work completed, under way and planned on Central Highway. Throughout Peru, $70 million is being appropriated under the five year program for major roadbuilding projects.

Hilton Plans New Network Of South American Hotels

A major expansion in South America is planned by Conrad Hilton, president of Hilton Hotels International, New York City. At present, discussions are being held with government and business leaders in each South American country for new hotels in all of the major cities.

Mr. Hilton, who intends to operate the hotels under long term agreements, says he expects jet airliners to increase travel substantially.

Hilton Hotels International is a wholly-owned subsidiary of Hilton Hotels Corp.

(*International continued on page 56*)

Three - Legged Islands

by R. G. LeTOURNEAU

For a long time, oil men have been looking for a practical, movable man-made island in the sea.

They've got to get out there in the open water, then stand still—in calm seas or hurricanes—long enough to drill deep under the ocean's floor for oil. If there isn't any oil, then it's pack up and move to another spot.

You don't find oil every time you drill, so any solution to the problem has got to include speed and mobility in changing locations.

The answer? Well, let's look at it this way. An island, that has withstood the beating of wind and waves for unknown milleniums, is an immovable object . . . while a ship that sails the seven seas is one of the most movable objects on the face of the globe.

In our solution to the problem, we've come up with a three-legged combination of the two. It's a big machine something like a barge, and weighs 4,000 tons.

You simply tow it out to where you want to drill for oil. Then electric motors run the legs down to the ocean's bottom and lift the entire machine up out of the water—on its own legs—high and dry.

And there it sits until the oil men are ready to move to another location. Then the barge runs down into the water again, the legs come up, and the rig's ready to be moved.

Not long ago, one of our "islands" pulled up stakes, moved a mile away and was back in operation in 8½ hours. An all-time speed record in offshore drilling.

If you ever have a chance, you'll enjoy a visit aboard one of these platforms. It has all the machinery for drilling an oil well, plus tanks for such things as fresh water, drilling water, fuel and drilling mud and storage for dry mud; even electric generating plants, cranes, a heliport, and air-conditioned living quarters with dining room and galley for 45 men. It's almost like a city.

The Platform itself is triangular in shape. Each of its three legs is also triangular and is of open, lattice-work construction so the waves can go right through with very little resistance. All three legs can be raised or lowered together or one at a time at the rate of 1 foot per minute. This makes it easy to level up the rig if some of the bottom should wash out around one of the feet.

And while we're on the subject of legs, the present ones are 145 ft. long—for drilling in water up to 100 feet deep—but we see no reason why an offshore drilling machine could not be built with the legs several hundred feet long. That's supposed to be one of the big problems of the industry. We think we've got it licked.

But building islands-in-the-sea is only one of our activities. We're also working with other big problems—in off-road transportation, logging, land clearing, heavy lifting, and many other things that require really big answers. And if you have a big problem that needs a big answer, we'll be glad to hear from you.

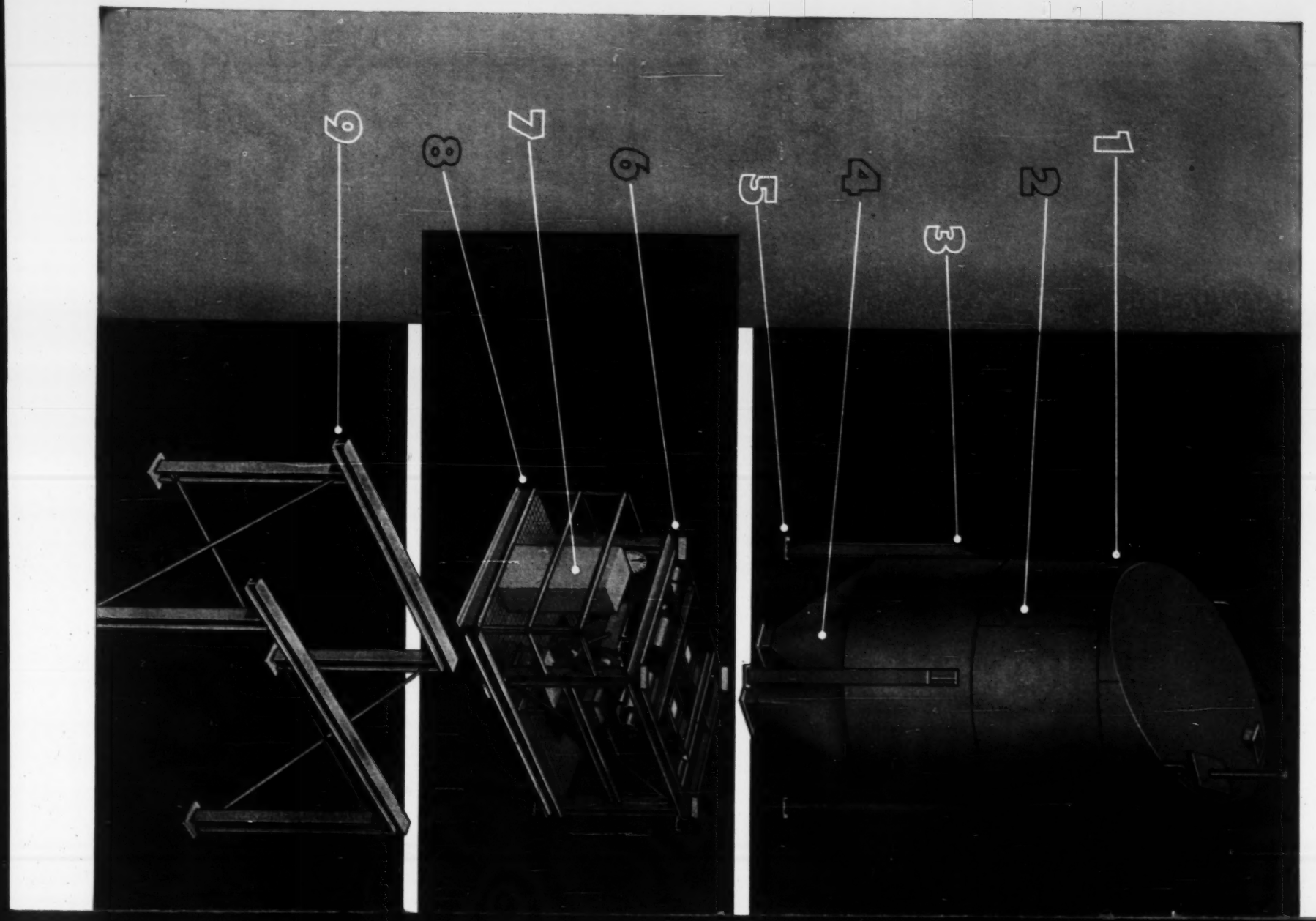
R.G. LeTourneau

LET

R.G. LeTOURNEAU INC

27210 SOUTH MAC ARTHUR • LONGVIEW, TEXAS

R-102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Designed especially for highway and airport work— it is the fastest, most accurate and portable plant of its kind

Heltzel's outstanding portable cement plant

• For the first time a batching plant that combines true portability with amazing accuracy and ultra high speeds.

Here's the cement plant engineered specifically for the highway and airport builder to deliver specification batches as fast as they can be handled—a plant that can be erected or dismantled in minutes by a skeleton crew, transported over existing roadways on standard truck equipment.

The unitized plant is fabricated in three easy to handle sections with instantaneous couplings for manual or automatic installation. The Bin Section (1) is completely factory assembled in capacities from 230 bbl. to 670 bbl. Of all welded heavy plate construction (2) the design utilizes rugged, wide flange beam columns (3). Single or double outlet (4) available for single, dual or twin batchers. Column connectors (5) are extra large for easy spotting and rapid assembly.

Batching or intermediate section (6) comes completely assembled with single, dual or twin batchers, fully automatic or manual, including the exclusive combination gravity and rotary vane cement feeder that means much faster charging with unmatched precision or the outstanding Heltzel tubular cement valve that can't freeze-up or jam.

It features the popular ultra-high speed Heltzel weighing system (7). Where desired a factory assembled platform extension (8) with metal decking is available. Support section formed of rugged, yet easy to handle wide flange beams (9) with bracing furnished for drive through in either direction. Elevators (not shown) are manufactured to move from 150 bbls. to 500 bbls. per hour with installations for either railroad or cement truck delivery.

You'll want to know more about this portable plant that works with all the speed and accuracy of a modern stationary plant. Contact your Heltzel representative or write direct.

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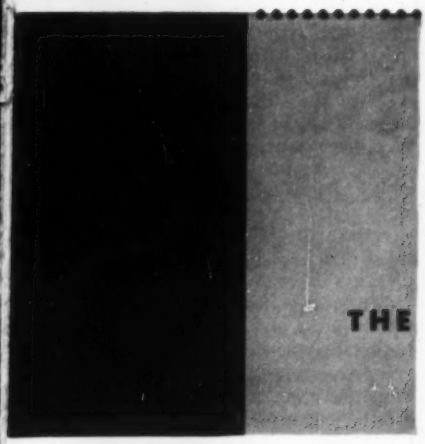


THE HELTZEL STEEL FORM AND IRON COMPANY

441 THOMAS RD., WARREN, OHIO

HOW TO HANDLE
WET JOBS

DEEP PIT
EXCAVATION
Malta, N. Y.
Excavator: Maloy, Dugan & Maloy
Gen'l Contractor: Carl Buhr, Inc.

DEEP PIT STABILIZED
DESPITE STEEP SLOPES

THIS JOB TOOK great engineering skill—to dig a 37-ft deep pit in fine sand containing 17 ft of water—to do this without collapse of the steep slopes, so that quantity of excavation could be held to a minimum. Furthermore, borings taken only to subgrade had not revealed a silt layer 6 ft below, and this added still another headache, since artesian pressure threatened to "blow the bottom."

• Using a combination wellpoint dewatering and pressure relief system (see photo) Griffin engineers stabilized the excavation . . . kept subgrade dry...solved all the problems economically and dependably. What's *your* problem?

GRIFFIN
WELLPOINT CORP.
881 East 141st Street, New York 54, N. Y.
Hammond, Ind. Houston, Tex. Jacksonville, Fla.
In Canada: Construction Equipment Co., Ltd.
Toronto Montreal Halifax

VENEZUELAN DRYDOCK, a $12 million project near Puerto Cabello, will operate on the same principle as a ship lock. Access to the dock will be through a 2,300 ft long canal.

Venezuela Rushes a New Drydock

A concrete drydock, capable of handling ships up to 30,000 tons, is being rushed to completion by December of this year in a valley two miles east of Puerto Cabello, Venezuela. When completed, this first step of a project will include 2 shipyards, 15 wharves, workshops, an access ship canal and an artificial bay.

Construction started in October, 1954. Since then, work has continued under supervision of the government's Ministry of Public Works, which is spending $12 million for the dock. A 2,300 ft long ship canal will permit vessels to navigate from the sea through the valley to the drydock that is sunk in the ground, its top almost flush with the earth's surface.

Operating on the same principle as a ship lock, the drydock will receive the boat as it floats in, then the gates will be closed and water pumped out at a rate of 186,000 gpm.

Tankers and freighters that operate to Venezuela will be able to use the drydock. But facilities will be of major importance to Venezuela's Navy and Merchant Marine. At present, all such ships have to seek drydock service in U. S. ports or at the nearby Dutch island of Curacao.

More than the drydock is going into the transformation of Puerto Cabello. Some 10 miles away, a $300 million petrochemical plant for producing fertilizers, explosives, plastics, synthetic rubber and gasoline is under construction. And a new 210 mile long, 20 in. oil pipeline from Barinas has its terminal on the coast nearby. In addition, the first step in Venezuela's national railroad plan—the line from Puerto Cabello to the agricultural center of Barquisimeto—is nearing completion, and construction has begun on a superhighway to Valencia.

Dredging Work Started On New Hawaiian Harbor

A new harbor in the Hawaiian Islands is being built by the Corps of Engineers and the Territory of Hawaii.

Kawaihae Harbor will be the second deep-water harbor on the island of Hawaii, biggest in the Hawaiian chain. The other is at Hilo, some 70 miles away.

The Corps, which started dredging operations last month, will dump 3 million cu yds of harbor bottom inside the new dikes and causeways, adding 100 acres to the island. Dredging will be financed by $2.5 million allowed for the project under the public works and water resources development bill signed by President Eisenhower in August.

After the fill is completed, the Territorial Harbor Board will build docks, cargo warehouses, fuel tanks, bulk sugar storage facilities, generator and water lines.

The new harbor site is in a relatively undeveloped area and will serve the northern and western parts of the island. Its construction is expected

to speed both tourist and agricultural development. At present, all imports to that part of the island come from Hilo by truck or air.

Utility Company to Spend $500 Million in Decade

British Columbia Telephone Co. plans expenditures of $500 million during the next 10 years for expansion and improvement of its facilities.

According to Gordon Farrell, company president, gross plant outlays by 1966 will total $475 million, of which $173 million will be obtained through sale of capital stock. To meet increased expenses of the proposed expansion, the company plans to increase its authorized capital from $75 million to $250 million.

One phase of the expansion program will include completion of British Columbia's share of the Trans-Canada microwave communication relay system. Thirteen towers will be constructed on mountain tops, some of them 7,000 ft above sea level.

Another portion of the program takes in construction of a $3.6 million addition to the company's head office at Vancouver. Work on the 12 story addition was started in August and its completion is scheduled for 1958.

Tap Water in Plastic Pipe to Cool Subsurface Cables

Plastic pipe, to carry city tap water, is being nestled among underground power cables as a cooling device. The system, pioneered by the Hydro-Electric Power Commission of Ontario, is being used in a $3.5 million cable laying project to replace steel towers carrying transmission lines from Niagara Falls to Toronto along a 3.5 mile route.

A total of 41.5 miles of oil-filled-type cable is being laid in groups of three cables to a circuit, four circuits in all.

Separating the three cables are two polyethylene pipes measuring ¾ in. diameter.

Through these pipes will flow city tap water supplied by municipal water mains. Every 1,600 to 2,000 ft the water will discharge into sewers and a fresh supply will be introduced. Intake and discharge will be controlled electronically so that temperature of the power cables will never go higher than 185 F.

The power-carrying capacity of the four circuits—140,000 kw at 115,000 v for a total of 560,000 kw with no cooling system—is expected to increase by about 50%, or an additional 300,000 kw.

THEY "TORTURE" PAINTS TO TOUGHEN PRODUCTS

Putting coatings to the test, Granco searches for protective "hides" that will make steel serve better, last longer.

Probably no construction material under the sun takes rougher punishment than steel deck. Bundled, stacked and often slammed into place, these sheets need sturdy protection against abrasion, damage and rust. To find a tough, tightly adhering paint for the job, Granco engineers put hundreds of sample coatings through severe laboratory tests. In the photo above, for example, you see how . . .

1. FALLING SAND TESTS measure paint's resistance to the abrasion that sheets absorb in rough on-the-job handling.

2. CALIBRATED SCRATCH TESTS measure paint's resistance to the cutting or gouging that damages finished products in shipment.

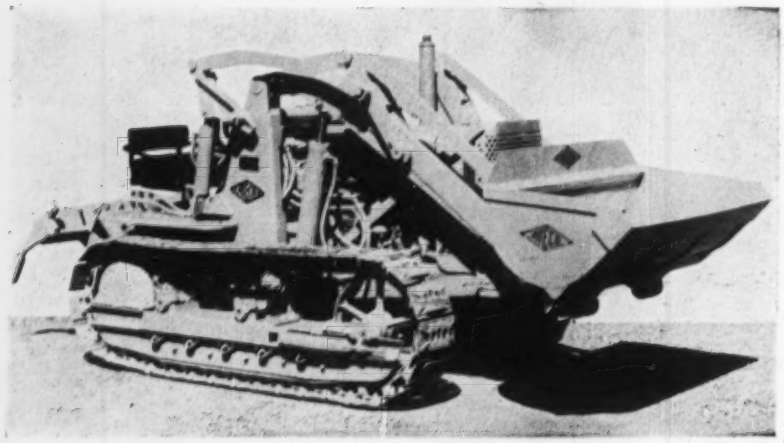
3. BEND TESTS show how coated surfaces withstand chipping and cracking by wrapping a sample around a small pin.

4. SALT SPRAY TESTS—simulating exposure to harsh weather—measure the resistance of coated metals to corrosion.

These and other tests are your guarantee of top performance from every Granco product, your assurance of even better construction materials as modern research develops them.

GRANCO® STEEL PRODUCTS COMPANY
6506 N. Broadway, St. Louis 15, Missouri
A Subsidiary of **GRANITE CITY STEEL CO.**
Distributors in 80 Principal Cities

GRANCO



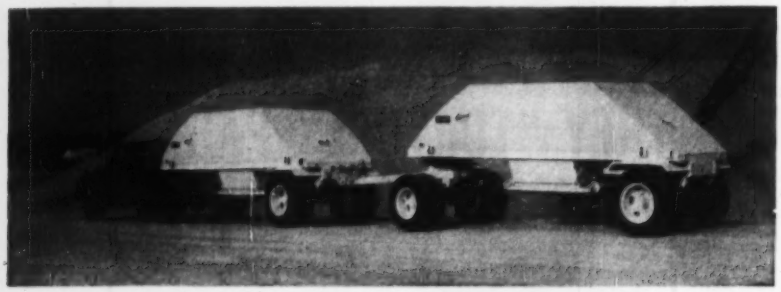
New Loader Has High Break-Out Power

A new hydraulically operated loader, designed specifically for the John Deere crawler tractor, is now in production.

Features include increased ground-level tilt-back for high breakout power, and increased bucket capacity. For longer service life with less maintenance, it has replaceable bushings at all hinge points. Track clearance has been increased and the mounting method improved for better stability and to eliminate excess strain and wear, according to the manufacturer.

Maximum lift is 9 ft 7 in. The bucket is 60 in. wide and dumps at a 50 deg angle. Maximum tilt-back at ground level is 32 deg.

Available attachments include scarifier-counterweight, lift fork, hay fork and crane. American Tractor Equipment Corp., 9131 San Leandro Blvd., Oakland 3, Calif.



Dual-Dump Trailers Double the Payload

Double payload with present tractors and personnel is offered by the new Clement Bonus Loader Dual Trailers, which are designed to operate as two 8 to 10 cu yd bottom dump units in train.

The units can turn in as little as 31 ft.

Cab-operated controls and air powered full width spreader gates permit either trailer to dump-on-the-run for full dump or windrow, and a train dolly converts the second unit to an independent trailer. Every wheel, including the fifth wheel dolly, is equipped with built-in electrical and air connected air brakes.

According to the manufacturer, the units are fast, rugged and feature economical operation.

It is said that they pull easily when loaded and with only one trailer deadheading back to the pit the empties return at almost the same fuel consumption as a single unit.

All welded construction adds strength to the rolled sides, and the tapered ends stop air whipping load losses. Clement-Braswell Inc., Shreveport, La.

Lightweight Chain Saws Now Can Produce 6.5 hp

Two chain saws with a high power-to-weight ratio are said to feature improved cooling, longer life and easier maintenance.

According to the manufacturer, the McCulloch Super 44, which produces 6.5 hp and weighs only 19 lb, is the most powerful lightweight direct-drive chain saw on the market. Its gear-driven companion, Super 55, also produces 6.5 hp and weighs 22 lb.

The cylinder head has been redesigned to provide more cooling for the increased cylinder bore. The fins, made longer and spaced wider apart, provide for better cooling and reduce clogging with sawdust, thereby increasing the life of both saws and spark plugs.

A hinged cover over the cylinder head permits easy servicing and provides additional protection against clogging.

The spark plug enters the cylinder head at an angle, hugging the head and saving space that made possible development of the spring hinged cover.

It is claimed that the spark plug temperature at the firing point has been reduced a full 100 deg and still provides ignition required for the large cylinder bore.

The air intake has been redesigned with an opening in the rear where it is less likely to pull in dirt and sawdust. The saws have been subjected to 3,000 hours of rigorous tests in a variety of working conditions in many parts of the nation.

A waterproof coil and automatic rewind starter with nylon-sheathed cable is said to insure perfect starting in any weather.

The Super 44 features center blade mounting and is available with 12, 18, 24, and 30 in. blades. Super 55 has a two-position blade mount for center or low stump cutting and is available with 12, 18, 24, 30, 36 and 42 in. blades, and with a 15 in. plunge bow for pulp cutting. McCulloch Motors Corp., 6101 W. Century Blvd., Los Angeles 45, Calif.

Low Bowl Scraper Designed For Use With Big Tractor

Low bowl scraper design has now been made available for use with the Caterpillar D7 tractor.

The 4 wheeled scraper, known as No. 435, replaces the Caterpillar No. 70 scraper in the company's line. According to the manufacturer, the low silhouette rack of the No. 435 allows

material to enter the scraper with a minimum of lifting effort.

The unit has a struck capacity of 13 cu yd, said to be an increase of over 27% over the now discontinued Model 70. The new machine can transport 18 cu yd, heaped. CATERPILLAR TRACTOR CO., PEORIA, ILL.

All-Weather Cab Produced For Popular-Make Tractors

An all-weather cab for use on International, Ford, Fordson Major, Case, Minneapolis-Moline, John Deere and Oliver Tractors is being produced.

The cab is designed to fit either the bare tractor, or tractors equipped with most combinations of front and rear-mounted equipment—such as loaders, back hoes, dozers, brooms, snow plows, post hole diggers, mowers, scrapers, cranes or trenchers. Controls may be mounted inside the cab to allow use of the tractor in all weather.

The cab fits tightly to the tractor, providing warm, windproof comfort; by merely snapping off or rolling up the side and rear curtains, the operator has cool, shady protection in hot weather. According to the manufacturer, the cab allows complete visibility in all directions, including upward through the large windshield and skylight.

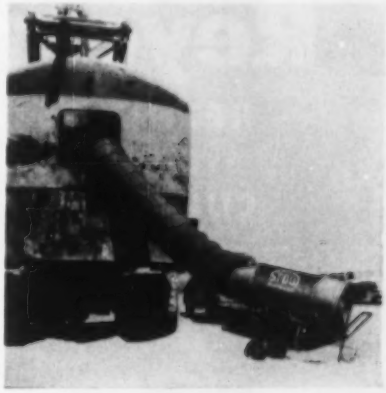
The frame, constructed of 12 and 14 gage steel, is mounted to withstand vibrations and hard usage. Side panels, which may be either rolled up or snapped off in warm weather, are of fire, water and mildew resistant canvas with heavy-duty vinyl plastic windows.

The cab comes packed in kit form, shipped "knocked down" for lowest freight rates, and is said to be assembled quickly and easily in the field. J. FRANK SIMS CAB CO., BOX 98, HOLDEN, MASS.

Portable Space Heater Can Warm Large Areas

A medium-capacity space heater, designed for the construction industry, delivers 120,000 Btu per hour at a rate of 950 cfm of heated air. It is said to use only 0.85 gal per hr of No. 1 or No. 2 fuel oil or kerosene.

Known as the Porto-Heat model 120, the heater weighs 80 lb and is 40 in. long by 16 in. high. The unit is set on wheels. It has an automatic electric ignition and a ½ hp motor-driven fan. An automatic cut off in case of power failure stops operation of the heater.



Optional equipment includes a hot-air duct, 15 in. in diameter and 10 ft long, made of treated canvas to resist fire and water. STOW MFG. CO., 19 SHEAR ST., BINGHAMTON, N. Y.

Crawler Equipment for Tunnel, Shaft Work

A new series of crawler equipment for shaft and tunnel excavation consisting of an overhead shovel loader, a bulldozer and a utility tractor has been introduced.

The machines come with either air or electric drive. With separate motors and independent track control for each track, one track can run forward and the other reverse to permit gradual or pivot turns or complete reversals within the machine radius. The manufacturer says the equipment can be tailored for virtually any head room or loading height requirements, and claims that the shovel loader can load 2 to 4 tons per minute. The loader can muck in round or rectangular shafts and takes over loading in the tunnel when the shaft reaches bottom. Buckets ranging in size from 5 to 11½ cu ft are available.

In tunnel construction, the dozer cleans up invert sections before concrete is placed and it also is used for cleaning out tunnels.

The tractor serves not only as a base for the shovel loader and dozer, but for various other attachments as well. These make it a full-face drill jumbo, roof bolter, front end loader, backhoe, scaler, or fork lift. It can do general drawback work with a pull of 12,080 lb. JOY MANUFACTURING CO., OLIVER BUILDING, PITTSBURGH 22, PA.

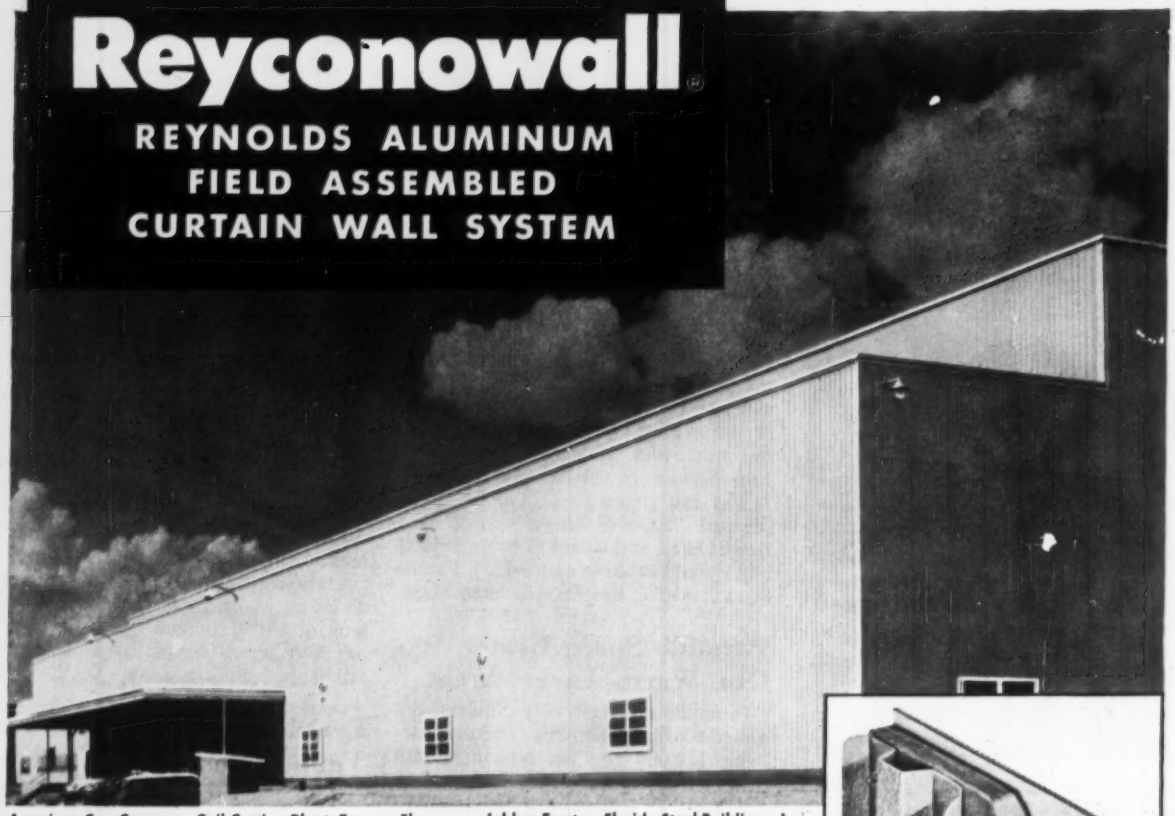
Tractor Travels on Cylindrical Tires

Equipped with four low-pressure Goodyear Terra-Tires, this 2,800 lb tractor built by Atwood Vacuum Machine Co. of Rockford, Ill., is able to negotiate rough, sloping terrain and to travel over snow, ice, mud, sand or wet surfaces.

Cylindrical tires give it versatility. They conform with uneven surfaces and glide over soft areas without bogging down.

The tractor, with a speed of 13 mph, is being recommended for use on highway construction projects, oil fields and lumbering. GOODYEAR TIRE & RUBBER CO., AKRON, OHIO.

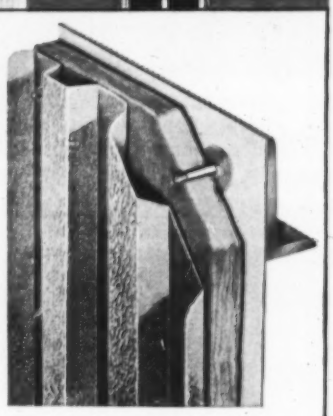
American Can Company Again Specifies



American Can Company Coil Cutting Plant, Tampa, Fla. Jobber-Erector: Florida Steel Buildings, Inc.

American Can Company's great expansion program makes impressive use of Reynolds Aluminum Field Assembled Curtain Walls. In addition to the 46,300 square foot Tampa installation, the company has also specified *Reyconowall* on plants at Hillside, N. J., and San Antonio, Texas. Extremely low in installed cost, *Reyconowall* combines aluminum's 95% radiant heat reflectivity with glass fiber insulation for minimum heat transmission. Lowest maintenance cost is assured because there's no need to paint rustproof aluminum. And with stucco embossed aluminum in this modern ribbed design, the buildings *look* as efficient as they are!

A complete installation service is available. For name of nearest franchised Jobber-Erector, call the Reynolds office listed under "Building Materials" in classified phone books of principal cities. Or write to Reynolds Metals Company, Building Products Division, Louisville 1, Ky.



In this *Reyconowall* installation the exterior is *Reynoside* 4" Rib .032" thick. The insulation is 1" glass fiberboard. The interior is flat sheet.

Drawings at left show *Reyconowall* using *Reynoside* 4" rib and 8" rib with 1" glass fiber board; interior sheets are Reynolds Aluminum Industrial Corrugated. Ribbed Embossed *Reynoside* is available in lengths from 5' to 22' 5".

REYNOLDS ALUMINUM

BUILDING PRODUCTS

Watch Reynolds all-family television program "Disneyland", ABC-TV.

Field Tests for Neoprene in Asphalt

Highway engineers in five states are cooperating with Du Pont company rubber chemists in testing asphalt containing neoprene synthetic rubber as an improved material for "surface treated" roads.

Many researchers hold the belief that neoprene may lengthen the life of the road surface and, at the same time, provide safer driving conditions and cut maintenance costs.

The synthetic rubber is mixed in specific proportions with standard asphalt, and the resulting surface material is applied with conventional equipment.

The test material is installed, side-by-side with untreated asphalt so that both surfaces will be exposed to identical wear.

In this way, regular periodic inspections of the strips will give accurate comparisons.

It is expected that neoprene will add elasticity to the asphalt, holding the stone chips in place longer. In addition to longer life, this should provide better traction, contributing an important safety factor.

Since most secondary roads are of the surface-treated type, Du Pont requested that "typical rural roads" be selected for test sites.

Roads are selected with curves, numerous rises, dips, and grades so that traffic can test the material under various conditions.

A recent test installation is a 5.3 mile strip in Lancaster County, Pa. This section is in the heart of the Amish community and, in addition to automobile traffic, there is heavy travel by horse and buggy.

Photographs are taken when the surface is applied at test sites. A highway engineer-rubber chemist team then inspects the condition of the strips at regular intervals and during unusual climatic conditions. At spots where unusual wear is expected, special patches are marked and a series of close-up photographs records how the material stands up. Usually these spots are selected on sharp curves, at the crown of rises or in the center of dips in the road.

In addition to Pennsylvania, test strips have been laid in Michigan, New Jersey, Delaware and Oklahoma. And plans are being completed to lay strips in Colorado, California and several other states.

Bricks by Bundles

First automatic packaging machine goes into action

The world's first automatic brick packaging machine—the "SCR package line"—has been installed for pilot plant testing at Des Moines Clay Co. in Des Moines.

According to Robert B. Taylor, director of the Structural Clay Products Research Foundation, the machine is the result of three years of intensive research at a cost of over $100,000. It is designed to automatically package 10,000 standard bricks per hour, ready for shipment.

In packaging standard sized bricks, each package contains 62 bricks made up of three individually strapped bundles of 20 bricks each plus two spacer bricks.

When containing bricks, the package is called the "SCR brick-pak" and when composed of structural tile, it is called the "SCR tile-pak". The machine also is capable of packaging most of the industry's other brick and structural tile products.

Adaptable for both light and heavy construction, these packages can be moved singularly by hand trucks on smaller jobs or several at a time with mechanical fork lifting equipment on larger ones.

Preliminary tests, Mr. Taylor says, have indicated savings of 15% or more in on-the-job labor through the reduction of handling costs under conventional methods.

In discussing this new development of the industry's research laboratories, Mr. Taylor said: "The SCR package line gives the construction industry a more efficient means of handling brick and tile products all the way to the scaffold position of the bricklayer at the wall".

In addition to reducing in-the-wall costs, the packaging system protects the product against damage in transit as well as during construction at the job site.

A nationwide meeting of member manufacturers of SCPRF at the Des Moines plant to observe the machine under actual production conditions is being planned for some time in the near future.

Additional demonstration meetings for other construction industry groups will follow.

Probing Smog

Fractional sublimation method developed to break down smog

Fractional sublimation is a new technique developed by researchers at the University of California, Berkeley, that promises to provide a tool to probe the chemical makeup of smog. The process is a method of isolating the separate components of polluted air into pure compounds, which may then be studied.

The process goes as follows:

(*Continued on page 62*)

• Air samples are weighed and placed in a glass sublimation tube under a vacuum.

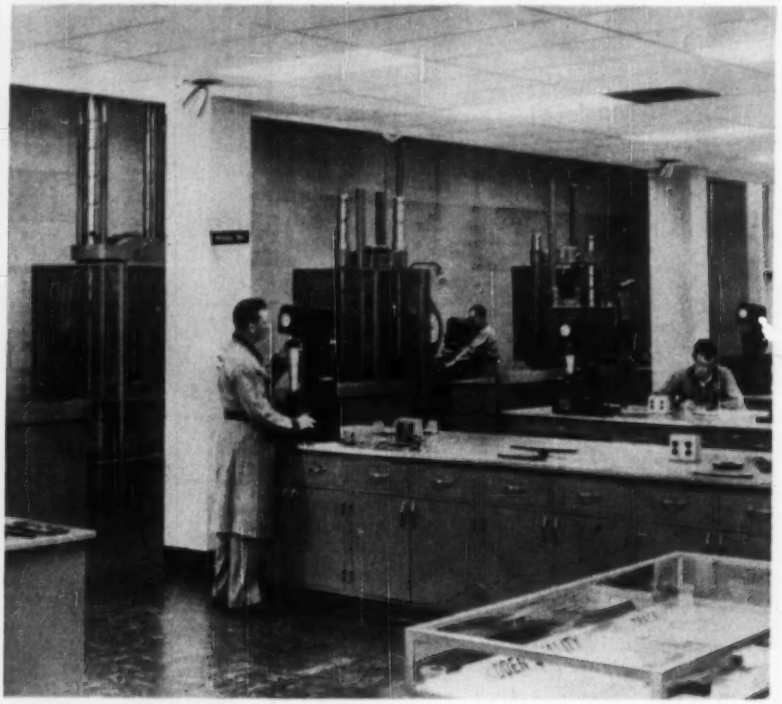
• The tube then slides into a special heating furnace, which allows a temperature gradient to be established along the tube. Adjustments in pressure and temperature, as the process occurs, cause the various components to vaporize and then to resolidify in pure crystalline bands.

• The pure compounds then are separated by cutting the tube into cylindrical sections.

By weighing the amount of a pure compound recovered, it is possible to calculate the amount of the compound per unit volume of the original air sample.

Fractional sublimation also will make it possible to produce polluted air components in quantities large enough to test their cancer-producing abilities on laboratory animals.

The process was developed by a University of California research team composed of Jerome F. Thomas, assistant professor of sanitary chemistry; Bernard D. Tebbens, professor of industrial hygiene engineering; and research chemists Mitsugi Mukai and Eldon N. Sanborn. The continuing research program is supported by the National Institutes of Health, U.S. Public Health Service.



PHYSICAL LABORATORY houses huge materials testing equipment; has asphalt tile floors, steel-clad columns and acoustic board ceiling.

Caterpillar's New Testing Laboratory

Testing machines up to 300,000 lb capacity were unveiled at a showing early this month of Caterpillar Tractor Co.'s new production, metallurgical and materials laboratory at its Peoria, Ill., plant.

Occupying 22,000 sq ft of floor space—about half of which is laboratory and the other half is offices—the 150x145 ft single story building is designed for 150 personnel.

Construction of the laboratory was started in September, 1956, and completed, ready for initial operation last April. Its chief function is to insure that all materials used in the manufacturer of Caterpillar machines are rigidly controlled throughout all stages of manufacture—and to develop new metallurgical practices and methods of evaluation.

The structure housing the laboratory facilities is, in reality, a building within a building. For it occupies an area in one of the existing buildings of the plant, which is part one story and part two story.

Structurally, the 150x145 ft building

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had to be adapted to fit existing column spacing, enclosed within existing exterior brick and masonry walls and contained beneath part of the existing roof and part of the old second floor. This challenged the knowledge and ingenuity of the company's architects and engineers; with the end result being a laboratory and office both exceptionally functional and providing a pleasant atmosphere in which to work.

To begin with, the existing steel columns were encased in removable steel panels. Office partitions also are movable steel panels—all with a baked-enamel eggshell finish and painted a light shade of green.

Three kinds of weather control are used in the building, which is air conditioned throughout. Air conditioning and forced hot air are furnished through ceiling outlets. Under normal conditions, the office area gets 50% outside air, with 50% being recirculated. The physical laboratory is supplied with 75% outside air, while 25% is recirculated. But the chemical section of the laboratory is air conditioned and heated using 100% outside air, with no recirculation.

Ceilings are acoustical board of spun glass fibers supported by small suspended T-bars. They are erected in removable 4x2 ft panels to give complete access from below. Recessed fluorescent lighting elements set flush with the ceilings furnish shadowless, uniform lighting of 50 ft-c intensity at desk level.

Floors in the office and physical laboratory sections are asphalt tile on concrete. Those in the chemical laboratory section are quarry tile set in acid-resistant mortar compounds. Office walls are of lightweight concrete block. Laboratory walls are of ceramic tile.

A 2 level under-floor duct system contains 110-v ac, telephone and intercommunications systems. Outlets are provided at 2 ft c-c to give maximum flexible operations.

A CO_2 sprinkler system protects the chemical laboratory areas. It has both automatic and manual controls.

A wide variety of materials is being tested in the physical laboratory section. They include forgings, castings, bar stock, tubing and nonferrous metals such as bronze, aluminum and brass. The largest of four tensile testing machines in the physical laboratory section has an ultimate capacity of 300,000 lb. Two machines have capacities of 120,000 lb each, and the fourth has a 200,000 lb capacity.

Extensive tests are made on rubber, cork, plastics, paints, oils, solvents, chemicals and fibers. Tests are also run on structural steel and concrete used in building plant facilities.

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Louis R. Howson

Out of Chicago, out of the ranks of big-time consultants, ASCE has drafted its 89th president. A sanitary engineer of great renown, the new . . .

ASCE President Is Top Waterworks Man

Louis Richard Howson increased his problems a thousandfold last week. The senior partner in a 40-man Chicago consulting firm assumed the presidency of the 40,000 member American Society of Civil Engineers.

How Mr. Howson came to take such a step is a success story of a rare type. It might be said that he traveled 2 million miles in 40 years of attending to his own business to arrive in the top professional post he assumed last Wednesday at ASCE's annual business session in New York (see also p. 21).

Most of his travels have been in the waterworks field, where his consulting and professional work long ago led him to presidency of the American Water Works Association.

Last week Louis Howson confided that his election to ASCE's vice presidency in 1955 and now his election to the presidency in 1957 were two more elections than he ever expected. The fact is, in 1950, as he began his original term on ASCE's Board, the then-Director Howson admitted that despite ASCE activity, waterworks and AWWA were his first love.

But his staunch supporters in the waterworks field, and in Chicago and the many major cities for which Alvord, Burdick and Howson have done engineering, saw to it that the Howson talent for hard work found application in ASCE, too.

Louis Howson is not a man to seek more to do than he can do well. If this is true of his work in professional organizations, it is much more apparent in his consulting work. Just to see him sitting in his office before his old roll-top desk is to realize that there is nothing ostentatious about this man. And as he recalls 40 years of consulting, and philosophizes a bit about consulting as a personal service, it is forcefully evident that here indeed is a gentleman of the old school.

Mr. Howson's 40-man firm—designing $10 million to $15 million worth of water and sewage plants annually—has made him a recognized national and international authority in his field. To most who know him (and know that both of his former illustrious partners have passed on), Louis Howson is the firm. Many who think they know him well would be hard pressed to name another person in his organization, although his partners now number six, and the youngest in length of service has been with him for 27 years.

• **From an engineering family**—Engineering ran in the Howson family (his two brothers also were civils) and consulting was in young Louis' mind even before he graduated from the University of Wisconsin in 1908.

But like many another successful civil engineering consultant, Mr. Howson started at a low level on the ladder. His first job after graduating from college was with the Burlington Railroad at $65 per month. After a few months of railroad construction on the outskirts of Chicago, he learned that Alvord and Burdick were to be the consulting engineers for Indiana Steel Company on design of a waterworks and sewerage system for a population of 100,000 persons at the newly born city of Gary, Ind.

"Luckily," reminisces Mr. Howson, "I got to talk to Mr. Alvord. After listening to my reasons for wanting to join his firm and learning that my salary was $65 per month, he offered me a job at $12 per week. In doing so, he

explained that he wanted me to take a long look ahead. He was not going to offer me any financial inducement to join his firm."

Mr. Howson took the job. For the first three or four years in it he alternated between drafting and design work in the office, and supervision of construction. Then, in 1913, he was made principal assistant engineer. Two years later he was admitted to a junior partnership in the firm, and in 1922, was made a full member as the firm name changed to Alvord, Burdick & Howson.

Reminiscing on his early engineering life, Mr. Howson pays great tribute to his former partners, John Watson Alvord and Charles Baker Burdick. He is grateful for their long association.

• **To a family-type firm**—The philosophy of Alvord, Burdick & Howson today is essentially as it was in the beginning. As Mr. Howson puts it, "We have purposely resisted the temptation to expand into what might become an unwieldly organization. We have always felt that a consulting engineering practice is pretty largely a personal service. While we appreciate the fact that our associates contribute largely to the success of the organization, we have always held the amount of our work down to a point where the partners can be in personal touch with the client. The present organization, as it has for several years, totals about 40."

Long tenure of service is an accepted fact in this big-time firm that refuses to grow. The seven living partners have a collective association of 260 years, a 35 year average.

• **The travelingest partner** – Back in 1913, when Louis Howson was advanced to the position of principal assistant engineer, it meant keeping in contact with the various field jobs. This meant a lot of traveling. Traveling became a habit, and undoubtedly, he is the travelingest member of his organization. For the past 40 years he has averaged 50,000 miles per year.

The question of getting engineers to travel today is a difficult one, he believes. Too many of them don't like it. Yet, on whether they travel depends a local or a national reputation, he thinks.

Much traveling is needed today to keep up with his firm's activities. All operations are limited to this continent, but they stretch from York, Pa., to Denver, and Montreal.

• **A waterworks owner** – Among Mr. Howson's interests are the two water companies of which he is co-owner and president. One serves a community of 12,000 in southern Illinois; the other, some 17,000 persons in Kentucky and West Virginia.

Alvord, Burdick and Howson have designed about 100 filtration plants in this country. They range from small ones to big ones, like Milwaukee (200 mgd). Moreover, the firm has engaged in consulting work with other firms on such plants as Chicago's 320 mgd plant on the south side, and the 960 mgd now abuilding in Lake Michigan at Navy Pier.

Business has always been good for Alvord, Burdick and Howson, even through the depression of the late 20's and early 30's. From 1930 to 1939 there were no layoffs. The company's earnings, naturally, hit some low levels during those years, but they were always in the black.

Looking ahead, Mr. Howson says: "My own views on the future have changed over the years. Thirty years ago I thought that when everyone got filtration plants, such business might slacken. But the opposite has been true. Now, I don't believe that will ever be the case. The chief reason: per capita consumption is growing and will continue to grow.

"A recent study of six representative cities in this country disclosed that daily water consumption has increased 2.3 gallons per capita each year for many years. That in itself means increased water treatment facilities. A secondary factor is the tremendous growth of population in urban areas. This trend, together with the strengthening of public demands for better water quality, has resulted in newer and bigger plants. Some cities today are spending more for taste and odor control, than they formerly spent for bacterial removel."

Taking over the reins of ASCE in New York last week, Louis Howson was prepared to use them. In his inaugural speech, he expressed concern over the lack of member participation at meetings, and he proposes to do something about it.

Mason Lockwood, the man from Texas whom Howson succeeds, is claimed to have traveled close to 90,000 miles since he hit the trail on ASCE business 12 months ago.

Louis Howson sees no better way to stir up the interest he wants in ASCE than to go forth and to do likewise.

As he goes forth among his sizeable flock over the year ahead, Society members will come to know Louis Howson as the Illinois Section's intimates know him: "As a gentleman; an honorable man whose soft-spoken advice is good advice; whose comments and reflections bear the stamp of much mature experience and wisdom. He is a leader who can plan organizations and get things done."

Careers

Public Works

Wesley A. Sweat has been appointed county engineer of Volusia County, Fla. He recently resigned as chief engineer of the Jacksonville Expressway Authority.

Robert J. Kimley of Greensboro has been named advanced planning engineer for primary interstate roads for the North Carolina Highway Department. He was formerly traffic engineer for the city of Greensboro.

Harold F. Holtz, a professional engineer and former construction contractor of Lincoln, Neb., has succeeded **Elmer H. Weaver** as commissioner of the Defense Materials Service of General Services Administration.

Fred T. Leebrick, of St. Louis, has been appointed director of accounting for the Arkansas Highway Department. He succeeds **J. Russell Henderson,** who has been reassigned as assistant engineer of statistics and analysis.

William M. Ingram of Raleigh has been named advance planning engineer for secondary roads for the North Carolina Highway Department.

Frank L. Hutchison of Waynesville has been named division engineer in charge of the 14th Highway Division, for the North Carolina Highway Department.

John H. Comiskey, Jr., has been appointed a traffic engineer of the Pennsylvania Department of Highways. He has been serving as the repartments safety engineer.

Harold A. Smith has been appointed assistant general, engineering, of the Hydro-Electric Power Commission of Ontario. He has been in charge of Ontario Hydro's nuclear energy development at Chalk River, Ont.

Joseph T. Bill has resigned as executive director of the Sacramento Redevelopment Agency to take the post of executive director of the Community Redevelopment Agency of Los Angeles.

Comdr. A. Newton Stewart has been made head of the Portland, Ore., office of the U. S. Coast and Geodetic Survey, replacing **Capt. E. B. Latham,** who retired and joined the faculty of the University of Portland.

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Unit Prices

Roads & Bridges in New Mexico

Half of this 5.584 mile, 4 lane divided highway is on or adjacent to the present road and requires traffic maintenance. This is a hot plant asphalt surface on cement stabilized base (unusual in New Mexico) and has two interchanges with bridge structures. It is 25 miles from the nearest railhead, on US 66 from Valencia-Bernalillo county line west.

New Mexico State Highway Department awarded the contract to O. D. Cowart, Albuquerque on a low bid 4½% under the second and 11% under the engineer's estimate.

Minimum wages on this job include: carpenters $2.65, cement masons $2.70, ironworkers, both structural and reinforcing $3.05, common labor $1.60, dump truck drivers $1.79-2.10, tractor operators $2.525.

Bidding included:

1C O. D. Cowart, Albuquerque, N. M.	$1,280,806
2 Imperial Paving Co., Oklahoma City, Okla.	1,344,879
7 Wayne A. Lowdermilk, Inc., Espanola, N.M.	1,982,024
EE New Mexico State Highway Dept. Santa Fe, N.M.	1,441,949

Bids: 7-26-57 Items	Unit	Quantity	Unit Price 1C	Price 2
Road				
Remov, old structures	ls	job	$2,000	$5,000
obstructions	ls	job	300.00	2,500
Excavation uncl	cy	745,580	0.33	0.33
for structures	cy	2,227	2.00	1.50
Watering	Mgal	47,460	0.10	0.50
Rolling, tamping roller	hr	2,020	5.00	11.00
pneumatic tired	hr	2,260	5.00	4.50
steel tired	hr	1,415	5.00	6.50
open roller, 50 t	hr	2,565	5.00	10.00
Mechanical tamping	hr	2,191	6.00	5.00
Overhaul, station yard	stay	918,918	0.01	0.01
Haul, quarter mile yard	¼miy	2,188,620	0.03	0.04
ton mile	tmi	1,449,620	0.055	0.06
Grading	mi	0.29	1,000	600.00
Riprap, wire enclosed	cy	15	30.00	10.00
wire fabric	lb	500	0.50	0.25
Cattle guard, 18' rdy	ea	2	1,800	2,000
24'	ea	2	2,400	2,400
Fence, stl pl guard	lf	6,200	3.10	2.80
galv barbed wire	lf	58,970	0.20	0.22
Gates, standard type	ea	4	75.00	50.00
Bracing	ea	64	12.50	12.00
Markers, right of way	ea	60	9.00	6.00
std, FAP, tp I	ea	1	100.00	80.00
Posts, refl, tr tmbr, 6"	ea	52	9.00	6.00
Contr gradation sub-base	t	143,585	0.60	0.63
Base course	t	61,925	0.75	0.55
Portland cement	bbl	9,885	6.50	5.50
Cmt treat base, cl A	sy	287,465	0.15	0.16
Bit material, tp RC2	bbl	1,390	8.20	7.60
Emuls asphalt AE3	bbl	720	11.00	8.15
Bit, matl, tp 120-150	bbl	850	8.60	8.35
Cover material	t	1,460	4.50	4.00
Plant mix surf course	t	21,070	5.00	4.22
Bit matl, tp 85-100, PM	bbl	6,500	8.50	6.85
tack coat	bbl	730	7.50	7.60
Conc, cl A	cy	1,932	45.00	58.00
B, cut off walls	cy	11	47.00	40.00
Steel reinf, struct	lb	484,547	0.15	0.14
wire fab	lb	160	0.50	0.25
Med curb & gutter	lf	2,400	1.75	2.00
Culvert pipe, 24"	lf	994	7.25	9.50
30"	lf	1,172	8.55	11.00
36"	lf	1,842	12.70	16.00
54"	lf	190	20.80	28.00
CMCP 12"	lf	238	4.25	4.50
Bridge				
Excavation, struct	cy	491	3.00	4.00
Conc, cl A superstruct	cy	303.58	60.00	65.00
substruct	cy	539.90	60.00	60.00
cl D precst girders	cy	304.48	100.00	100.00
Steel, struct	lb	51,494	0.35	0.30
Piling, treat timber	lf	5,464	4.00	4.50

Completion Schedule: 300 working days

Prices on unusually small jobs for New Mexico are illustrated by contract let to J. H. Ryan & Son, Inc., Albuquerque, for the underpass at Ft. Sumner, $117,885 and for Taos Junction Bridge, $98,126. On these wages range from $1.60 for common labor through $2.00 for semi- to $2.50 for skilled.

Cl A concrete is AASHO M-148-49, 6 bags of cement per cu yd.

Taos Junction Bridge — 85 mi from RR

1C J. H. Ryan & Son, Inc., Albuquerque, N. M.	$98,126
2 James P. Johnson, Santa Fe, N. M.	102,159
5 Wayne A. Lowdermilk, Inc., Espanola, N. M.	125,130
EE New Mexico State Highway Dept., Santa Fe., N. M.	81,886

Bids: 3-22-57 Items	Unit	Quantity	Unit Price 1C	Price 2
Road				
Remove old struct	ls	job	$5,000	$2,000
Excavation-uncl	cy	15,200	1.50	1.60
for pipe culv	cy	71	3.00	6.00
Watering	Mgal	440	1.00	1.00
Mechanical tamping	hr	233	3.00	6.00
Station yard overhaul	styd	15,600	0.04	0.04
Obliterate old road	mi	0.2	1,000	500.00
Markers, right of way	ea	14	10.00	10.00
std FAP, tp I	ea	2	100.00	100.00
Tr tmbr warn posts refl 8"	ea	22	7.50	10.00
Culvert pipe 54"	lf	64	20.00	20.00

Bridge — 100 ft stl through truss span & two 25 ft precast conc approach spans on stl pipe line column foundations

Excavation, struct bridge	cy	339	20.00	10.00
Derrick stone riprap	cy	728	7.00	7.00
Excavation for riprap	cy	53	10.00	5.00
Conc bridge substr, class A	cy	111.35	100.00	100.00
precast bridge units	cy	30.92	125.00	130.00
Seal concrete	cy	90.74	60.00	80.00
Reinf concrete struct	lb	25,537	0.18	0.17
Steel, struct. f	lb	6,522	0.50	0.50
bridge railing	lf	304.25	5.00	10.00
Treated timber superstr f	Mbm	11.283	400.00	500.00
SP pile columns 16"OD	lf	212.5	12.00	20.00
Conc pile cols, cl C	cy	10.30	40.00	100.00
Steel, struct e	lb	99,457	0.15	0.14
Treat timber superstr e	Mbm	8.712	200.00	500.00

Complete: 75 work days. Liq dam: $100/day

Fort Sumner Underpass — 1 mi from RR

1C J. H. Ryan & Son, Inc., Albuquerque, N. M.	$117,885
2 F. D. Shuffleberger, Albuquerque, N. M.	127,858
6 E. M. Silver, Albuquerque, N. M.	161,260
EE New Mexico State Highway Dept., Santa Fe., N. M.	148,050

Bids: 3-22-57 Items	Unit	Quantity	Unit Price 1C	Price 2
Road — 0.291 mi				
Excavation-uncl	cy	71,925	$0.27	$0.40
struct	cy	150	2.00	2.50
Watering	Mgal	3,575	0.10	0.10
Rolling tamping roller	hr	185	5.00	5.00
pneumatic tired	hr	115	5.00	4.00
steel tired	hr	15	5.00	15.00
Operate 50t roller	hr	195	5.00	5.00
Mechanical tamping	hr	90	10.00	6.50
Ton mile haul	tmi	7,005	0.10	0.08
Markers, right of way	ea	4	10.00	6.50
std FAP, tp I	ea	2	100.00	50.00
Contr gradation sub-base	t	2,125	2.00	1.50
Base course	t	1,380	2.00	2.30
Bit matl, type MC-1	bbl	70	8.00	8.00
120-150	bbl	100	8.00	8.00
Cover material	t	210	5.00	9.00
Concrete, cl A	cy	34.1	80.00	100.00
reinf. struct	lb	80,986	0.16	0.20
Grouted rock retards	cy	25	20.00	25.00
Bridge — 127 ft 3-span conc & stl				
Exc struct bridge	cy	2,030	3.00	5.50
Undrdrns-PCGMP 8" bit ct	lf	76	3.00	3.00
Conc, bridge substr, cl A	cy	682.78	60.00	47.00
D	cy	221.59	60.00	66.00
Waterproofing concrete	sy	130	5.00	2.00
Membrane waterproofing	sy	205.1	5.00	3.00
Steel, struct	lb	10,310	0.50	0.42
Asphalt plank	sy	200.2	10.00	13.00
Gravel backfill	cy	40	5.00	3.75

Complete: 200 work days. Liq dam: $100/day

Materials and Labor Prices

Monthly Market Quotations by ENR Field Reporters

See following ENR issues for OTHER PRICES:

- Clay Products, Lime, Plaster, Paint, Roofing: Last, Sept. 26; Next Oct. 31.
- Wage Rates, Building Board, Lath, Insulation: Last, Oct. 3; Next Oct. 31.
- Cement Aggregates, Ready-mixed Concrete Asphalt: Last, Oct. 10; Next Nov. 7.
- Iron & Steel Products, Pine: Last, Oct. 17; Next Nov. 14.

LUMBER, TIMBER, PLYWOOD—PER M FT., B.M., CARLOAD LOTS F.O.B.

SOUTHERN PINE AND DOUGLAS FIR

All Southern Pine is No. 2 common or better and for No. 1 N. C. Box. (Prices in Bold Face)

All Fir boards, dimensions, planks No. 2, Fir small timbers and timbers are No. 1. Lengths up to 20 ft. (Prices in italics)

	1x8 s4s	1x8 s4s	2x4 s4s	2x6 s4s	2x8 s4s	2x10 s4s	3x12 Rgh	6x12 Rgh	12x12 Rgh	LONG LEAF Y. P. Merchantable grade up to 20 ft. 2x12 Rgh	LONG LEAF Y. P. Merchantable grade up to 20 ft. 12x12 Rgh	PLYWOOD Rail freight increment (See note for base price) ¼"	PLYWOOD Rail freight increment (See note for base price) ¾"
Atlanta †	$73.00	$76.00	$76.00	$79.00	$81.00	$86.00	$136.00	.....	.....	$121.00	$156.00	$22.32	$27.24
Baltimore *	95.00	100.00	100.00	100.00	100.00	105.00	114.00	.....	.....	170.00	185.00	25.92	31.60
	100.00g	*105.00g*	*125.00g*	*125.00g*	*125.00g*	*125.00g*	*133.00g*	*$150.00*	*$144.00*				
Birmingham †	87.00	89.00	89.00	89.00	92.00	97.00	112.00	.....	.....	115.00	160.00	21.78	26.58
	108.50	*108.50*	*108.00*	*108.00*	*108.00*	*115.00*	*111.50*	*108.50*	*108.50*				
Boston ‡	97.00f	97.00f	103.00f	103.00f	103.00f	115.00a	.....	.....	.....	.....	.....	25.92	31.60
	98.00k	*95.00k*	*111.00*	*111.00*	*111.00*	*119.00*	*124.00*	*129.00*	*133.00*				
Chicago **	94.00	97.00	91.00	105.00	113.00	114.00	109.00	.....	.....	137.00	137.00	22.45	27.37
	102.00	*102.00*	*115.00*	*115.00*	*115.00*	*114.00*	*122.00*	*122.00*	*122.00*				
Cincinnati *	93.00	94.25	84.50	90.50	95.00	102.75	116.00	.....	.....	139.25	137.50	25.00	30.48
	97.00	*98.00*	*102.75*	*104.75*	*105.75*	*109.00*	*130.00*	*130.00*	*130.00*				
Cleveland **	94.00	95.00	97.00	97.00	97.00	97.00	.....	.....	.....	.....	.....	25.37	30.93
			114.00	*105.00*	*105.00*	*105.00*	*136.00*	*136.00*	*136.00*				
Dallas k‡	70.00	70.00	65.00	65.00	65.00	70.00	140.00	.....	.....	130.00	130.00	18.72	22.80
Denver *	*Not in stock*		*122.50*	*122.50*	*122.50*	*127.00*	*141.50*	*148.50*	*148.95*			13.92	16.98l
Detroit ‡	116.50	119.50	114.00	117.00	122.00	122.00	.....	.....	.....	130.00	.....	25.00	30.48
	125.00	*125.00*	*130.00*	*122.50*	*130.00*	*135.00*	*125.00*	*125.00*	*125.00*				
Kansas City ‡	120.00	120.00	120.00	120.00	125.00	135.00	.....	.....	.....	.....	.....	16.56	20.16
	130.00	*130.00*	*130.00*	*130.00*	*125.00*	*130.00*	*160.00*	*225.00*	*225.00*	.....	.....	16.61ab	20.25ab
Los Angeles ‡	*95.00*	*95.00*	*95.00*	*95.00*	*95.00*	*95.00*	*119.00*	*130.00*	*130.00*	.....	.....	19.80	24.25
Minneapolis #	*135.00m*	*135.00m*	*140.00*	*140.00*	*140.00*	*140.00*	*135.00*	*135.00*	*135.00*	.....	.....	.....	.....
Montreal ab	92.00	100.00	92.00	93.00	110.00	128.00 §	.....	.....	.....	125.00	125.00	.....	.....
	178.00	*178.00*	*178.00*	*178.00*	*178.00*	*178.00*	*171.00*	*171.00*	*171.00*				
New Orleans †	87.00	87.00	94.00	91.00	90.00	97.00	121.50	.....	.....	181.00	181.00	18.72	22.80
†	*110.00*	*110.00*	*104.50*	*120.00*	*120.00*	*120.00*	*130.00*	*138.50*	*138.50*				
New York ‡	107.00	108.00	114.00	116.00	116.00	120.00	.....	.....	.....	240.00	255.00	25.92	31.60
	.....		*116.00*	*119.00*	*120.00*	*121.00*	*164.00*	*164.00*	*164.00*				
Philadelphia ‡		Range from 109/129				112/132	133/155			214/224	214/224	28.00	32.00
		Range from 120/150				*131/163*	*136/168*	*168.00*	*165.00*				
Pittsburgh 2	125.00	125.00	125.00	125.00	130.00	130.00	.....	.....	.....	180.00	.....	25.92	31.60
	135.00	*135.00*	*140.00*	*140.00*	*145.00*	*145.00*	*180.00*	*200.00*	*210.00*				
St. Louis #	118.00	120.00	128.00d	128.00d	128.00e	133.00e	.....	.....	.....	.....	.....	18.72	22.80
			137.00	*137.00e*	*137.00e*	*141.00e*	*195.00e*	*195.00*	*195.00*	.....	.....		
San Francisco †	*74.00*	*74.00*	*80.00*	*82.00*	*80.00*	*80.00*	*105.00*	*116.00*	*116.00*	.....	.....	13.23	14.91a
Seattle †	*67.00*	*72.00*	*73.00*	*73.00*	*73.00*	*74.00*	*85.00*	*90.00*	*90.00*	.....	.....	.....	.....
Toronto a	91.50	95.50	90.50	91.50	91.50	91.50	.....	.....	.....	93.50	.....	.....	.....
	115.00	*115.00*	*101.00*	*103.00*	*107.00*	*101.00*	*146.00*	*141.00*	*141.00*	.....	.....	.....	.....

† F.o.b. mill. * F.o.b. city, CL, out of yard. ** F.o.b. city, CL, direct mill shipment. ‡ Deliv. to contr. CL. 1. Retail, LCL, at yard. # Retail, LCL, deliv. 2. Deliv. truck lots. 3. asd., truckload lots, $/8 Mfbm

LUMBER: Bold Face Type, Southern Pine. Italics, Douglas Fir. a Spruce. b Tax exempt. c 8M lots. d 8, 10, & 12 ft. lengths. e 8 to 16 ft. lengths. f Hemlock g No. 1 common. h 8 ft. lengths. k No. 3 common. l Incl rail rate from North west mills to San Francisco are $11.50 to $15.00 per M ft. bm. From Northern Calif. mills $9.00 by rail, $9.50 by truck. All rates for surfaced stock. For rough, add $3.00 to above figures. m Up to 18"

PLYWOOD (Ptyform, oiled and edge sealed): Douglas fir, 4' x 8' panels, 5-ply sanded 2 sides, carload lots, delivered per 1000 sq. ft. surface. Seattle base price, Interior, moisture resistant, ¼", $148.00; ¾", $166.00. Exterior, waterproof, ¼" $150.00; ¾", $170.00. For other centers add rail freight increment from table on proper size. a Lower rate by water shipment. b 50,000 lbs. minimum.

GLASS, EXPLOSIVES, CHEMICALS

WINDOW GLASS

Discounts from jobbers list, Feb. 1, 1950a

	Single or Double Strength A quality	Single or Double Strength B quality
Atlanta	78%c	78%e
Baltimore	74%d	76%d
Birmingham	82%	83%
Boston	73–10%'	73–10%
Chicago	72%	72%
Cincinnati	74%	74%
Cleveland	74–3–10%	74–3–10%
Dallas	76%	76%
Denver	74%	74%
Detroit	74–10–10%	74–10–10%
Kansas City	76–10–10%	76–10–10%
Los Angeles	70%	76%e
Minneapolis	71–10%	71–10%
Montreal	40–10–8%bc	40–10–8%b
New Orleans	78%	76%
New York	79–10%	79–10%
Philadelphia	74–10%	76–10%
Pittsburgh	72%	72%
St. Louis	73–10–10%	72–10–10%
San Francisco	60%–25%	60%–25%
Seattle	67%	72%

Price of 80% Ammonia Gelatin in $0.15 per lb. higher than 40% in U. S., $1.75 per 100 lbs. higher in Canada.

Glass: a Jobbers' list price per box, 14 x 20, ss, $42.75 for A quality, $37.50 for B quality; 14 x 20, ds, $60.00 for A quality. $52.75 for B quality. b Sales tax extra. c 77% for single strength d Discount 8/15/52. e 77% for double strength

EXPLOSIVES

Per lb. 40% Ammonia Gelatin in 50 lb. cases delivered in 200 lb. lots*

Atlanta	$0.2615
Baltimore	.2615
Birmingham	.2665
Boston	.2615
Chicago	.2615
Cincinnati	.2615
Cleveland	.3015
Dallas	.2690
Denver	.2665
Detroit	.2615
Kansas City	.2665
Los Angeles	.2640
Minneapolis	.2665
Montreal	22.05h
New Orleans	.2665
New York	.45g
Philadelphia	.2615
Pittsburgh	.2615
St. Louis	.2665
San Francisco	.2615
Seattle	.2640

Explosives: * Cartridges of 1¼", 1½", 1¾", 2", 2½", 2¾", 3" diameters. **Urban prices influenced by service charges or local storage and delivery regulations do not consistently reflect quantity prices in less congested areas.** g In borough of Kings, Queens, and Richmond and in Manhattan south of Canal St., add delivery charge of $20.00 per trip. h F.o.b Beloeil (near Montreal), per 100 lb. forcite, 40%. Forcite 60%, $23.80

40% Ammonia Gelatin price ranges in other than urban areas, per lb. (except Seismograph Grades)

	C/L 20,000 lb. net	Tons	200 lb. lots
E of the Miss., except Fla. and Me.	$0.2065	$0.2465	$0.2615
W of Miss. to Rocky Mtn. States, Fla. and Maine	.2115	.2515	.2665
Rocky Mtn. States	.2115	.2515	.2665
Pacific N. W. States	.2090	.2490	.2640
Pacific S. W. States	.2065	.2465	.2615

PILES, TIES F.O.B.

PILES

Prices per linear foot, fir and pine, bark off, f.o.b. cars, New York. Fir based on Wash. and Ore. points to New York shipping area; pine based on freight from Norfolk.

Dimensions	Points	Length	By Rail Pine*	By Rail Fir
12-in. at butt	6-in.	30 to 50-ft.	$0.51	.....
12-in.—2-ft. from butt	6-in.	50 to 59-ft.	.54	.....
12-in.—2-ft. from butt	6-in.	60 to 69-ft.	.58	.....
12-in.—2-ft. from butt	6-in.	90 to 100-ft.	.....	.....
13-in.—3-ft. from butt	8-in.	91 to 100-ft.	.....	.....
14-in.—2-ft. from butt	6-in.	50 to 69-ft.	.60/.68	.....
14-in.—2-ft. from butt	6-in.	70 to 79-ft.	.78/.88	.98
14-in.—2-ft. from butt	8-in.	80 to 85-ft.	.83/.98	.94
14-in.—2-ft. from butt	8-in.	85 to 89-ft.	.....	1.00
14-in.—2-ft. from butt	8-in.	90 to 100-ft.	.....	1.09

* Pine piling over 80-ft. available only in limited quantities

RAILWAY TIES

Prices f.o.b. per tie for carload lots:

		8' x 8" x 8' Untr.	8' x 8" x 8' Tr.	7' x 8" x 8'8" Untr.	7' x 8" x 8'8" Tr.
Birmingham*	Hardwood, Grade 3	$1.70	$3.55	Gr. 3 $3.25	$3.33
	Grade 2	1.80	3.38	" 2 3.10	3.18
	Grade 1	1.15	2.00	" 1a 1.70	2.78
Chicago	Red Oak		4.00a		4.60a
New York	S. L. Sap Pine	2.00	4.00	3.00	6.00g
	Mixed Oak	2.50	4.50	3.50	6.50g
Philadelphia	Red Oak	2.95/3.15	4.50/4.70	3.80/3.90	5.50/5.75
St. Louis	White Oak	2.65		2.95b	
	Red Oak	2.55	3.40a	2.80b	3.90a
San Francisco	Douglas Fir	2.03af	2.96af	2.84baf	4.31eaf

Tr.—Treated; Untr.—Untreated. a Crossoted. b 7" x 9" x 8'. c Empty cell d 6 x 8 x 8'6" e Green. f f.o.b. cars. * Add 75¢/tie freight charge to Birmingham. *h 7" x 9" x 9½"

CHEMICALS

Water, sewage treatment, road work, f.o.b. carlots, New York

Bleaching powder in drums f.o.b. works, per 100 lb	$5.02
Chlorine cylinders, liquid, per lb. f.o.b. works	.103
Calcium chloride, 77–80%, flaked, 100-lb. paper bag, f.o.b. works, ton	29.00
Silicate of soda, 52 deg., in drums, f.o.b. works, per 100 lb	2.30
Soda ash, 58%, in paper bags, per 100 lb. dense	1.70
Sulphate of aluminum, commercial, in 100-lb. bags f.o.b. works	1.85
Sulphate of copper, in bags, 99% per 100 lb. f.o.b. works	14.90

Construction Reports

Bids Asked—Low Bidders—Contracts Awarded—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. WETZEL, M. E. SCIORRA, D. TARTAGLIA, Reports
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
October 29 Massachusetts

▲ **Mass., Boston**—BA 10/31—City, P. Wks. Dpt., City Hall Annex, South Bay Incinerator. $2,000,000. Plans deposit $100. Extended date. Metcalf & Eddy, Statler Bldg., engrs. CD 10/2.

BUILDINGS—BA

▲ **Conn., Danbury**—HOUSING—BA 11/14—Danbury Housing Auth., Lake Ave. Exten., PHA Proj. No. Conn. 20-1, low rent housing, incl. 10 buildings and sewer pumping station addn. $2,000,000. Plans deposit $100. CD 5/23/56.

▲ **Mass., Wilbraham**—SCHOOL—BA 11/19—Towns of Wilbraham and Hampden, c/o Marshall E. Roper, chn., 196 Main St., Wilbraham, regional high school. $2,000,000. Alderman & MacNeish, 594 Riverdale St., West Springfield, archts. CD 7/2.

▲ **Mass., Boston**—DORMITORY—BA 11/29—Boston University, Bd. Trustees, c/o R. W. McLaren, bus. mgr., 755 Commonwealth Ave., Proj. No. MASS 19-CH-6 (D) Women's Residence Hall, Bay State Rd. and Sherburn St. $2,000,000. Plans deposit $60.

HEAVY CONSTRUCTION—LB & CA

▲ **MASSACHUSETTS**—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,
Central Constr. Co., Lawrence, Mass. and **The Henley Lundgren Co.**, 193 Hartford Pike, Shrewsbury, Mass. LB $2,283,889, est. $2,931,739, hy. and bridge constr. Rte. 28 to Wood St., Middleboro. Bids Oct. 15. CD 9/23.

BUILDINGS—LB & CA

▲ **Perini Corp.**, 73 Montwaite Ave., Framingham, Mass., CA. Approx. $3,200,000, PUBLISHING BUILDING, Albany, Troy and Castle Sts. and Harrison Ave., BOSTON, MASS. Herald-Traveler Corp., 80 Mason St., Boston, Mass.

▲ **George A. Fuller Co.**, 597 Madison Ave., New York, N. Y., CA $7,000,000. 16 story OFFICE bldg., Purchase and Hartford Sts., BOSTON, MASS. Travelers Insurance Co., 700 Main St., Hartford, Conn. Kahn & Jacobs, 2 Park Ave., New York, N. Y., archts. CD 6/17, under CA.

▲ **Purdy Hill Acres**, Route 111, Stedney Depot, Conn., Owner Builds. $2,826,000, 180 HOUSES, "Purdy Hill Acres", Route 111, MONROE, CONN.

▲ **George L. Hickey, Inc.**, 13 Spring St., Stamford, Conn. CA $2,934,890. Proj. BI-R-134, J. M. Wright Technical SCHOOL, STAMFORD, CONN. State P. Wks., 165 Capitol Ave., Hartford, Conn. Bids Sept. 18. CD 9/20, under LB.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS
October 29 Maryland October 29, 31 New Jersey

▲ **N. J., Ridgewood**—BA 10/29—Village, Village Hall, 131 N. Maple Ave., sewage treatment plant, $2,500,000. CD 8/8.

▲ **Pa., Pleasant Hills**—BA 11/14—Pleasant Hills Auth., 72 Clairton Blvd., Pittsburgh, 2 plants for sewage imprvs., Div. ABCD, Plant Plans Div. E. Sec. 1, 2, 3, 4, 5. $2,500,000. Plans deposit $35. for ABCD, $65 E Sec. 1, 2, 3, 4, and 5. Consoer, Townsend & Assocs., 360 E. Grand St., Chicago, Ill. and Clark Bldg., Pittsburgh, engrs. CD 7/5/55.

BUILDINGS—BA

▲ **N. J., Newark**—OFFICE—BA 10/29—Prudential Life Insurance Co., 763 Broad St., 24 story home office, 753 Broad St. $20,000,000; 7 story office, South Bldg., 763 Broad St., $3,000,000. Extended date. Voorhees, Walker, Smith & Smith, 101 Park Ave., New York N. Y., archts. CD 9/20.

▲ **N. Y., Brooklyn**—SCHOOL—BA 11/12—Bd. Educ., Bureau Constr., 42-15 Crescent St., Long Island City, Zone 1, general construction, plumbing and drainage, heating and ventilating, electrical work and lighting fixtures, for Public School 279, Avenue "K" between E. 103 and 104 Sts., $2,327,751. Plans deposit $25 for general constr., $7 for each of others. CD 9/17.

▲ **N. Y., Brooklyn**—SCHOOL—BA 11/14—Bd. Educ., Bureau Constr., 42-15 Crescent St., Long Island City, Zone 1, general construction, plumbing and drainage, heating and ventilating, electrical work and lighting fixtures for Public School 286, corner of Haring St and Ave. "Y", $2,368,644. Plans deposit $25 for general constr., $7 each of the others. CD 9/17.

▲ **Pa., Harrisburg**—PATIENTS—BA 11/20—General State Auth., 18 and Herr Sts., patients bldg. and dietary service unit for Harrisburg State Hospital. $1,920,000. Plans deposit $15 each. C. J. Lappley, Riverview Manor Apts., archt. A. F. Jones, c/o owner, ch. engr. CD 10/17/56.

▲ **N. Y., Albany**—EDUCATION ANNEX—BA 11/21—State Dpt. P. Wks., The Gov. Alfred E. Smith State Office Bldg., Albany, 10 story State Education Bldg. annex. $6,000,000. CD 7/30/43.

BUILDINGS—SLC

▲ **N. Y., New York**—STUDENT FACULTY CENTER—Fordham University, Fordham Rd., soon lets contract student faculty center on campus, $3,600,000. Voorhees, Walker, Smith & Smith, 101 Park Ave., New York, Zone 17, archts. CD 10/15/56.

HEAVY CONSTRUCTION—LB & CA

▲ **NEW YORK**—Dpt. P. Wks., The Gov. Alfred E. Smith State Office Bldg., Albany, Bids opened 10/10,
N. Y.—**Slattery Contg. Co.**, 46-36 54 Blvd., Maspeth, N. Y. LB $12,750,713, est. $16,340,000. (16 bidders), 9-in. c. conc pavt. (ramp) 0.05 mi.; work incl. 76 span comp. girder and 1-beam viaduct 5.330.1 ft. (Bruckner Expressway) Sec. 1, Contr. 2, Proj. I-U-1086 6), Dist. 10, Bronx Co.;
N. Y.—**Peckham Road Corp.**, 50 Haarlem Ave., White Plans, N. Y. LB $74,280, est. $84,000. (2 bidders), b. conc., c. conc. 0.47 mi. Bar Mountain Bridge, Rte. 6, Rockland and Westchester Counties;
N. Y.—**Bero Constr. Corp.**, Waterloo, N. Y. LB $3,492,116, est. $3,894,000. (4 bidders), viaduct substructure in city of Lackawanna; Arterial Rte. Fuhrmann Blvd.-Hamburg Turnpike viaduct, Ridge Rd.-North City Line Contr. 4, City of Buffalo; Arterial Rte. Fuhrmann Blvd.-Hamburg Turnpike, viaduct (South city line-Tifft St.) Contr. 4 and misc. work, Proj. U-750 (12), Erie Co. CD 9/12.

▲ **NEW YORK**—State Dpt. P. Wks., The Gov. Alfred E. Smith State Office Bldg., Albany,
N. Y.—**Bero Constr. Corp.**, Waterloo, N. Y. CA $3,362,624. 1.02 mi. 2.16 acc. mi. Interstate Rte. 505, City of Syracuse, Oswego Blvd. Syracuse-Mattydale, S.H. 54-3, Phoenix-Syracuse, S.H. 5274, Onondaga Co.;
N. Y.—**E. G. Delia & Sons Constr. Corp.**, New Hartford, N. Y. CA $615,053. 3.53 mi. Route 7, Wells Bridge-Otego, S.H. 5153, Otsega Co. Bids Sept. 19, awarded Oct. 8. CD 9/25, under LB.

▲ **NEW YORK**—Dpt. P. Wks., The Gov. Alfred E. Smith State Office Bldg., Albany, Bids opened 10/10,
N. Y.—**A. S. Wikstrom, Inc.**, Skaneateles, N. Y. LB $2,722,561, est. $3,570,000. (7 bidders) b. conc. 6.87 mi. 1 railroad separation comp. I-beam 544.5 ft.; railroad separation cont. I-beam 172.88 ft.; one hy. separation comp. I-beam 151.66 ft.; one rein.-con. open box bridge 23.4 ft. in City of Ogdensburg, Rte. 37 Arterial City of Ogdensburg; Rte. 37 connection Ogdensburg-Morristown, Pt. 1, SH 878; Ogdensburg-Waddington Pt. 1, SH5497 and Ogdensburg-Waddington SH 9357, Contrs. FAC 57-16 FASH 57-9 FARC 57-171. Proj. U-UG-650 (7), St. Lawrence Co.;
N. Y.—**H. L. Baughman, Inc.**, 1240 Jefferson St., Rochester, N. Y. IB $810,631, est. $878,000. (4 bidders) c. conc., b. conc. 1.21 mi., incl. 160 ft. comp. I-beam bridge in Falconer Village, SH 5067, Falconer-Kennedy, SH 698, Rte. 17, Proj. F-449 (7), Dist. 5, Chautagua Co.;
N. Y.—**Bero Constr. Corp.**, Waterloo, N. Y. LB $892,981, est. $1,002,000. (3 bidders) c. conc. wid'n. b. conc. 0.136 mi. incl. railroad separation comp. I-beam 185 ft.; 118.5 ft. prestressed concrete bridge, extend existing pedestrain overpass elimination of grade crossing of N.Y.C. R.R. with Main St., Village of Minoa and Snyder Rd., town of Manlius, Dist. 3, Onondaga Co.;
N. Y.—**American Chain & Cable Co., Page Steel & Wire Div.**, 230 Park Ave., New York, N. Y. LB $91,058, est. $113,000. (5 bidders) furnishing, erecting aluminum chain link fencing 4.83 mi. Southern State Parkway (Cont. 14) Nassau and Suffolk Counties;
N. Y.—received no bids Oct. 10, b. conc. 4.34 mi., incl. 76 ft. prestressed concrete bridge in City of Niagara Falls Arterial Rte. Walnut Ave. and Ferry Ave. (Main St. to Pine Ave. and Packard Rd., Proj. U-500 (9), Niagara Co. Est. $1,435,000, will re-advertise. CD 9/12.

▲ **PENNSYLVANIA**—State Hy. Dpt., 506 North Office Bldg., Harrisburg,
S. J. Groves & Sons Co., Box 8, Ann Arbor, Mich. CA $3,434,037. 26,900 ft. divided hy. c. conc., 5 bridges L.R. 797 (2) section Erie Thruway, Springfield and Girard Twps., Platea Boro, Erie Co., Bids Sept. 27. CD 10/10, under LB.

BUILDINGS—LB & CA

▲ **Sordoni Constr. Co.**, Forty Fort, Pa., CA $3,500,000 HOTEL and parking area, BINGHAMTON, N. Y. Sheraton Corp. of America, 470 Atlantic Ave., Boston, Mass. Bids Aug. 26. CD 8/12.

▲† **Baldwin-Lima-Hamilton Co.**, Eddystone, Pa., CA 246 MAGNET CORES for atom smasher at Brookhaven National Laboratory, BROOKHAVEN, N. Y. Atomic Energy Comn., 1901 Constitution Ave. N.W., Wash. 25, D. C. CD 10/26/55.

▲ **Wigton Abbott Corp.**, 1225 South Ave., Plainfield, N. J., CA Est. $3,500,000 design and construct 2 story, 105x244 ft. Hooker RESEARCH CENTER incl. 2 story library on 61-acre site near North Grand Island Bridge bounded by N. Y. State Thruway to the east, Long Rd. to south, curving West River Parkway along the west branch of Niagara River and Buckhorn Island State Park, GRAND ISLAND, N. Y. Hooker Electrochemical Co., Box 344, Niagara Falls, N. Y. CD 9/11/57.

▲ **Hugh Stern**, 17 Colony Court, Murray Hill, N. J. Own Forces. $6,000,000, 150 HOUSES on 160 acre tract, Ketch and Raynor Rds., Hanover and Sussex Aves., MORRISTOWN, N. J. Robert Edwards Assocs., 210 Morris St., Morristown, N. J., engrs.

▲ **Tabor Homes**, c/o Samuel L. Malkind, archt., 559 W. 24 St., New York 36, N. Y. Owner Builds. $2,000,000, 63 HOUSES, Maple St. and Central Ave., NEW PROVIDENCE, N. J.

▲ **Du-Share Builders, Inc.**, 30 Knickerbocker Rd., Dumont, N. J. Own Forces. $2,000,000, 30 HOMES, TENAFLY, N. J. Harsen & Johns, Piermont Rd. and Summit St., Tenafly, N. J., archts.

▲ **D. S. Warfel Assocs., Inc.**, 440 N. Princee St., Lancaster, Pa. $2,340,900 HOSPITAL addn., LANCASTER, PA. Lancaster General Hospital, 525 N. Duke St., Lancasater, Pa. Bids Aug. 22, CD 9/14, under LB.

▲ **Turner Constr. Co.**, 150 E. 42 St., New York, Zone 17, N. Y. CA $14,000,000 Hilton HOTEL, PITTSBURGH, PA. Hilton Hotels Corp., 401 7th Ave., New York, N. Y. Bids Sept. 25, CD 9/19.

▲ **Henry A. Knott, Inc.**, 2406 Greenmount Ave., Baltimore 18, Md., CA $2,295,000, masonry, concrete, steel block, CHILDRENS VILLAGE BUILDING, Dulaney Valley TOWSON, MD. Archdiocese of Baltimore, Charles and Mulberry Sts., Baltimore 1, Md. Bids Aug. 22. CD 9/5, under LB.

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction
(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England — **Middle West**
Middle Atlantic — **West of Mississippi**
South — **Far West**

PROPOSED WORK
Water Supply — **Public Buildings**
Sewers, Waste Disposal — **Mass Housing**
Bridges — **Commercial Buildings**
Streets & Roads — **Industrial Buildings**
Earthwork, Waterways — **Unclassified**

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.
SOON LETS CONTRACT: SLC
LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.
CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.
CD dates shown are of Construction Daily Issue in which last previous report was published.
OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

† Federal Government
▲ Project of $1,000,000 or over.
ENR Engineering News-Record
CD Construction Daily

For additional reports see Construction Daily.

SOUTH

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES
October 29 West Virginia

STREETS AND ROADS
October 29 West Virginia

▲ N. C., Greensboro—COLISEUM—BA 11/19—War Memorial Coliseum Comn., City Hall, memorial coliseum, $4,000,000. McMinn, Norfleet & Wicker, 2828 Lawndale Dr., archts. CD 9/23.

BUILDINGS—BA

▲† S. C., North Charleston—FAMILY HOUSING—BA On Or About 11/21—U. S. Eng., P. O. Box 905, Charleston, 12 unit Capehart Family Housing at Charleston Transportation Depot, ENG-38-081-58-01.

▲† S. C., Parris Island—FAMILY HOUSING—BA 12/12—Dist. P. Wks. Office, Bldg. No. 13, Naval Base, Charleston, 355 single unit dwellings, Capehart Family Housing, incl. clearing, grubbing, road and street sys., water distr. sys., sanitary sewerage sys., storm drainage, electrical distr., telephone distr. and landscaping, at Marine Corps Recruit Depot NBy (CH)-13909. Plans deposit $50. per set, incl. reduced size lithograph prints, or $150 per set incl. full size prints. CD 9/21/56.

HEAVY CONSTRUCTION—LB & CA

▲ FLORIDA—State Rd. Dpt., Tallahassee, The Scott Co., Thomasville, Ga., CA $2,125,211 superstructure, incl. one through-truss channel span of 327 ft. 6-in. 2 rein.-con. spans 22 ft. 3½ in. 4 continuous welded steel plate girder units, each unit being 400 ft. long, 3 spans 123-154-123 ft. lengths and 21 pre-cast prestressed concrete beam spans of 66 ft. each 0.636 mi. over West St. Andrews Bay near Panama City, SR 30, F 017-2 (12) (Job 4602-207) Bay Co. Bids Sept. 19, awarded Oct. 8. CD 9/26, under LB.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES
November 6 Michigan

STREETS AND ROADS
October 29 Ohio November 6 Michigan

BUILDINGS—BA

▲ Ill., Hinsdale—RESEARCH CENTER—BA 11/4—International Harvester Co., 180 N. Michigan Ave., Chicago, Ill., 1 and 2 story, brick, 500,000 sq. ft. research center, w/s of County Line Road between Plainfield and Joliet Rds. $5,000,000. Raymond Loewy & Assocs., 444 N. Michigan Ave., Chicago, archts. CD 9/24/56.

▲ O., Oxford—BA 11/6—DORMITORIES—Ohio Dpt. P. Wks., State Dpts. Bldg., Columbus, O., 2 dormitories, Miami University, $1,500,000. Plans deposit $20. Fosdick & Hilmer, 1703 Fifth-Third Bldg., Cincinnati, engrs. Ceilerius & Hilmer, 613 Gas & Electric Bldg., Cincinnati, archts. CD 2/20.

▲ W. E. O'Neil Constr. Co., 2751 Clybourn Ave., Chicago, Ill. LB $2,097,489, temp. railroad structures, C and NW grade separation, NW Rte. Superhighway, CHICAGO, ILL. City, City Hall, Chicago, Ill. CD 2/13/45, under Streets and Roads.

▲ WISCONSIN—State Hy. Comn., E. L. Roettiger, hy. engr., State Hy. Office Bldg., Madison, Jos. D. Bonness, Inc., 10815 Watertown Plank Rd., Wauwatosa 13, Wis., CA $2,185,541, grade, subbase, base b. conc. 6.443 mi. Int. Rte. 101, The Illinois State line-Milwaukee Co. line (S. T. H. 50-S. T. H. 11 Section) Rd., Proj. 1 101-1(4), Kenosha and Racine Counties, Bids Sept. 24, CD 10/3.

BUILDINGS—LB & CA

▲ Huber-Hunt & Nichols, 2450 Stibbs St., Indianapolis, Ind., CA Est. $2,000,000, 1 story, 75,000 sq. ft., masonry, steel FACTORY and OFFICES, INDIANAPOLIS, IND. Chevrolet Motor Div. General Motors Corp., 335 W. 9 St., Indianapolis, Ind. Argonaut Realty Co., Argonaut Bldg., Detroit, Mich., archt.

▲ Carl E. Erickson Co., 4657 N. Ravenswood Ave., Chicago, Ill., CA $2,000,000, 1 story, brick, 110,000 sq. ft. BAKING PLANT, 5337-74 N. Elston Ave., CHICAGO, ILL. Kitchen of Sara-Lee, Inc., 2109 S. Carpenter St., Chicago, Ill. Bids Sept. 16, CD 9/9.

▲ Dunbar Bldrs. Corp., 2637 W. Peterson Ave., Chicago, Ill., Own Forces. $2,000,000, thirty 4 unit APARTMENT BLDGS., Budlong Woods and West Rogers Park, 2800 block Hollywood and 5600 block N. California, CHICAGO, ILL. Ernest Mandel, 6410 N. Fairfield Ave., Chicago, Ill., archt.

▲ Enjay Constr. Co., 105 W. Madison St., Chicago, Ill. CA $2,000,000, 1 story, 200,000 sq. ft. WAREHOUSE, Busse Rd. and Industrial Blvd., near Elk Grove Village, CHICAGO, ILL. I. A. A. Food Stores, c/o Franklin MacVeagh & Co., 1347 S. Clinton St., Chicago, Ill. James Rhines, 105 W. Madison St., Chicago, Ill., archt.

▲ Joseph A. Duffy Co., 4994 N. Elston Ave., Chicago, Ill., LB $5,998,242, 1, 2 and 3 story HIGH SCHOOL, bit paving, concrete walks, Roosevelt and Ardmore

Dumpcretes help link New York State Thruway and Garden State Parkway

A 2½ mile section of 4-lane divided concrete highway linking the New York State Thruway with the New Jersey Garden State Parkway was completed by George M. Brewster & Son, Inc., using seven Dumpcretes to handle 30,000 cu. yds. of concrete from portable plant.

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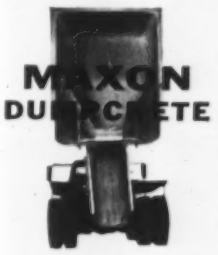

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Manufacturing Division 22
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Axes., ELMHURST, ILL. York Comm. High School Dist. 88, 355 W. St. Charles Rd., Elmhurst, Ill. Bids Sept. 25, CD 8/26.

▲ **Edward Gray Corp.**, 12233 Ave. O, Chicago, Ill. LB $5,007,532, 320,000 sq. ft. West Leyden HIGH SCHOOL, with swimming pool and fieldhouse, 34 acre site, Grand Ave. and Wolf Rd., FRANKLIN PARK, ILL. School Dist. 12, Franklin Park, Ill. Bids Oct. 3. CD 7/31.

▲ **The Frankel Brothers**, 1336 No. Woodward, Royal Oak, Mich., CA Est. $2,500,000, Franklin Valley brick ranch HOMES, 13-Mile Rd. east of Middlebelt, BLOOMFIELD, MICH. Gordon Williamson Co., 19180 Grand River, Detroit.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES
November 1 Missouri

STREETS AND ROADS
October 29 Iowa — November 1 Missouri
November 12 Oklahoma

BUILDINGS—BA

▲† **Tex., El Paso**—HOUSING—BA 12/22—U. S. Eng., Box 1538 Albuquerque, N. M., 125 Capehart Housing units for Wm. Beaumont General Hospital, incl. utilities. $1,000,000-$5,000,000. CD 9/30.

▲† **Minnesota**—POWER PLANT—Bids Asked—Atomic Energy Comn., 1901 Constitution Ave. N.W., Wash., D. C., design, develop, construct and test operate boiler water nuclear reactor and conventional fuel-fired superheater power plant on system Rural Co-operative Power Assn., Elk River. $9,000,000. CD 4/25/56.

HEAVY CONSTRUCTION—LB & CA

▲ **MISSOURI**—State Hy. Dpt., Jefferson City,
Mo.—**Universal Bridge Co., Inc.**, 1202 S.W. Blvd., Kansas City, Kan., CA $303,494, 6-61 ft. (twin) continuous I-beam spans, Sta. 600 plus 16, Buchanan Co.; CA $117,678, 3-50 ft. concrete deck girder spans (twins), Sta. 592 plus 64, Buchanan Co.;
Mo.—**Stupp Bros. Bridge & Iron Co.**, 3800 Weber Rd., St. Louis, Mo., CA $1,687,678, plate girder spans Missouri River approach superstructure, Boone and Cooper Counties; CA $2,354,986, steel truss spans Missouri River superstructure, Boone and Cooper Counties;
Mo.—**Maxwell Bridge Co., Inc.**, Columbus, Kan., CA $626,390, Missouri River approach substructure, Boone and Cooper Counties. Grand total $5,090,226. Bids Sept. 26, awarded Oct. 9. CD 10/8, under LB.

▲† **U. S. Eng.**, 1709 Jackson St., Omaha, Neb., rejected bids Sept. 17, power structure, intake shafts and upstream tunnels, Oahe Reservoir Proj., near Pierre, Inv. 25-066-58-17, SOUTH DAKOTA. LB $14,452,260. CD 9/25, under LB.

▲ **Northern Natural Gas Pipe Line Co.**, 2223 Dodge St., Omaha, Neb., Owner Builds. $76,199,000, 415 mi. pipe line from Beatrice Neb. to Joliet, Ill., NEBRASKA, IOWA AND ILLINOIS. CD 9/22/52.

▲ **TEXAS**—State Hy. Comn., Austin,
Tex.—**Texas Bitulithic Co.**, P.O. Box 10365, Dallas, Tex., CA $3,187,168 c. conc. 1.112 mi. Hy. US 77 Proj. I. 22 (18) Dallas Co.;
Tex.—**Stuckey Constr. Co., Luce Constr. Co., N. F. Bradley**, P.O. Box 1645, Wichita Falls, Tex., CA $1,285,253 c. conc. 3.485 mi. Hy. Loop 281-C 156-3-15, Wichita Co.;
Tex.—**Moorman's, Inc.**, P.O. Box 1509, Muskogee, Okla., CA $762,226 grading, structures and grade separation 5.666 mi. Hy. US 75, Proj. I 569 (20) & F 569 (13), Ellis Co.;
Tex.—**Adams Bros.**, P.O. Box 310 Athens, Tex., CA $514,857 flex. base and one course surf. treat. and b. conc. 11.711 mi. Hy. US 69, Proj. F. 566 (8) Cherokee Co. Grand total $5,749,504. Bids Oct. 11. CD 9/23.

BUILDINGS—LB & CA

▲ **J. C. Sargent & Co.**, 2101 W. 21st St., Topeka, Kan., Owner Builds. $2,500,000. 200 unit HOUSING, Highland Park Add., TOPEKA, KAN.

▲ **Robert E. McKee**, 2708 Inwood Rd., Dallas, Tex. CA Est. $2,500,000. 201,297 sq. ft. Mercantile Commerce OFFICE BLDG. addn., DALLAS, TEX. Mercantile National Bank, c/o Main and Commerce Sts., Dallas, Tex. Bids Oct. 1. CD 9/27.

▲ **W. L. Wyman & Sons**, 1408 N. Atol St., Dallas, Tex., Owner Builds. $7,500,000, 600,000 sq. ft., masonry SHOPPING CENTER, 35-acre tract at Lancaster Rd. and Kiest Blvd., DALLAS, TEX. Williams & Surles, 6501 Hillcrest St., Dallas, Tex., archts.

▲ **Terminal Realty Corp.**, c/o Norman Epstein, 1301 Terminal Rd., Fort Worth, Tex. Owner Builds. $10,000,000. Westwood Addn., incl. 400 HOMES, bath, club and shopping center, over 125 acre site, FORT WORTH, TEX. Kneer & Hamm, 2509 W. Berry St., Fort Worth, Tex., archts. CD 5/15/56.

▲ **Mead & Mount Constr. Co.**, 1560 Denver Club Bldg., Denver, Colo., CA $3,271,900, 7 story, 2 bsmnt. 160,000 sq. ft. STATE SERVICE BLDG. E. Colfax Ave. and Sherman St., DENVER, COLO. Bids Oct. 4, awarded Oct. 10. CD 10/11, under LB.

FAR WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES
November 6, 7, 14 California

STREETS AND ROADS
November 6, 7, 14 California

▲ **Calif., San Diego**—BA 11/18—San Diego Co. Water Auth., Land Title Bldg., first 10.57 mi. section of second San Diego Aqueduct to bring water from Colorado River. $7,000,000-$8,000,000. Richard S. Holmgren, genl. mgr. and chf. engr. of CWA. CD 7/31.

HEAVY CONSTRUCTION—LB & CA

▲ **IDAHO**—State Hy. Dpt., Boise, Bids opened 10/8, **S. S. Mullen, Inc.**, 621 9 St. N., Seattle, Wash., LB $2,011,540, constr. roadbed, drainage structures and seven 101.4 ft. concrete bridges on 13.344 mi. N.S. 95, Craigmont-Culdesac, Lewis and Nez Perce Counties. CD 9/25.

▲ **WASHINGTON**—State Hy. Comn., Olympia, Bids opened Oct. 15,
Morrison-Knudsen Co., Inc., 319 Broadway, Boise, Idaho, LB $14,226,690, est. $11,063,000, constr. floating section of Hood Canal bridge, Kitsap Co. CD 9/13.

▲† **Cherf Brothers, Sandkay Contractors, Green Constr. and S. Birch & Sons**, Central Bldg., Seattle, Wash., CA $2,894,330. Sch. 1, Keene Creek dam and Green Springs power conduit and Sch. 4, concrete cylinder pipe (pretensioned reinforced) or welded plate steel pipe, Rogue River Proj., Spec. DC 4948, OREGON. Bureau Reclmaation, Dpt. Interior, Camp White, Ore. Bids Sept. 10. CD 9/17, under LB.

▲ **Morrison Knudson Co. & Macco Corp.**, 411 West 5th St., Los Angeles, Calif. CA $12,089,596 welded steel pipe for constr. 14 mi. pipe line from Santa Ana Canyon to Los Angeles County East Boundary, LOS ANGELES, CALIF. Metropolitan Water Dist., 306 W. 3rd St., Los Angeles, Calif. Bids Oct. 2. CD 10/7, under LB.

▲† **Cherf Brothers, Sandkay Contractors, Green Constr. and S. Birch & Sons**, Central Bldg., Seattle, Wash., CA $2,894,330. Sch. 1, Keene Creek dam and Green Springs power conduit and Sch. 4, concrete cylinder pipe (pretensioned reinforced) or welded plate steel pipe, Rogue River Proj., Spec. DC 4948, OREGON. Bureau Reclmaation, Dpt. Interior, Camp White, Ore. Bids Sept. 10. CD 9/17, under LB.

▲ **Morrison Knudson Co. & Macco Corp.**, 411 West 5th St., Los Angeles, Calif. CA $12,089,596 welded steel pipe for constr. 14 mi. pipe line from Santa Ana Canyon to Los Angeles County East Boundary, LOS ANGELES, CALIF. Metropolitan Water Dist., 306 W. 3rd St., Los Angeles, Calif. Bids Oct. 2. CD 10/7, under LB.

▲† **Diversified Builders**, 1616 S. Greenwood St., Montebello, Calif., CA $3,540,000. constr. hangar and aircraft parking area, Naval Ordnance Test Station, China Lake, Spec. 7413-56, SAN DIEGO, CALIF. P. Wks. Office, Eleventh Naval Dist., San Diego, Calif. Murray Erick & Assocs., 5657 Wilshire Blvd., Los Angeles, Calif., engr. Bids June 18. CD 6/21, under LB.

BUILDINGS—LB & CA

▲ **The Lembke Constr. Co.**, Box 1391, Las Vegas, Nev. LB $3,215,231 (9 bidders) subject to 6 alternates CONVENTION CENTER, LAS VEGAS, NEV. Clark County Fair & Recreation Bd., Court House, Las Vegas, Nev. Bids Oct. 3. CD 8/8.

▲ **The Pacific Co.**, 801 Cedar St., Berkeley, Calif., LB $1,901,000 (3 bidders) wood frame except shop and gym, rein.-con. Clayton Valley HIGH SCHOOL, Clayton, CONCORD, CALIF. Mount Diablo Unified School Dist., c/o Supt., Concord, Calif. Bids Oct. 8. CD 9/17.

▲ **Hilp & Rhodes Constr. Co.**, 918 Harrison St., San Francisco, Calif., CA $3,000,000 2 story, 220,000 sq. ft. STORE BLDG. at Palma Ceia Shopping Plaza, near HAYWARD, CALIF. Sears, Roebuck & Co., 2650 Olympic Ave., Los Angeles, Calif. CD 10/8/56.

▲ **General Electric Co.**, River Rd., Schenectady, N. Y., Owner Builds. 30 kw facility, light water cooled and moderated, RESEARCH REACTOR, PLEASANTON, CALIF. CD 5/29.

CANADA

BUILDINGS—BA

▲ **Que., Montreal**—MEDICAL—BA 10/30—Bd. Governors, Royal Victoria Hospital, Pine Ave. W., 9 story, with frame, stone medical bldg., rein.-con. fdn. to provide about 192 adult beds and a 53 bed children's ward, $5,000,000. Barott, Marshall, Merrett & Barott, 1425 Mountain St., archts. CD 5/2.

HEAVY CONSTRUCTION—LB & CA

▲ **Montreal Metropolitan Comn.**, 506 St. Catherine St. E., Montreal, Que., contract rescinded, 13,000 ft. Section 1, Metro Blvd. Expressway, incl. work at Decarie traffic circle, MONTREAL, QUE. Will re-advertise. CD 10/3.

▲ **Pentagon Constr. Co., Ltd.**, 5005 Namur St., Montreal, Que., LB $3,459,000 (8 bidders) constr. Elevator B-1 and marine towers at Montreal Harbor, MONTREAL, QUE. National Harbors Bd., West Block, Parliament Bldgs., Ottawa, Ont. Bids Sept. 4. CD 9/4.

LATIN AMERICA

HEAVY CONSTRUCTION—BA

▲ **Argentina**—BA 12/30—Comision Nacional del Rio Bermejo, Av. Pte., Roque Saenz Pena 501, 70 piso, Buenos Aires, 450 mi. canal parallel to Bermejo River from Oran oilfields, Salta to Parana River at Barranqueras, Chaco, incl. 4,000 sq. km. artificial lake at Oreon; with locks and gates for power and irrigation. Total est. $222,000,000.

PUERTO RICO

BUILDINGS—BA

▲† **Puerto Rico, Mayaquez**—RESEARCH and TRAINING REACTOR—Bids Asked—Atomic Energy Comn., Oak Ridge, Tenn., U.S.A., fixed price proposals for 1,000 kw. research and training reactor at University of Puerto Rico. Total est. $2,800,000. CD 10/7.

U. S. POSSESSIONS

HEAVY CONSTRUCTION—LB & CA

▲ **HAWAII**—Territorial Hy. Eng., Wm. M. Wachter, Territorial Hy. Dpt., Honolulu,
J. M. Tanaka, Honolulu, T.H., LB $2,237,869. Nuuanu Pali Road, Outbound tunnels, Fed. Aid Proj. BF 061-1 (5) Districts of Honolulu and Koolaupoko Island of Oahu, incl. two rein.-con. lined vehicular tunnels of 1,080 lin. ft. and 496.5 lin. ft., respectively. Bids Oct. 10. CD 8/14.

FOREIGN

HEAVY CONSTRUCTION—BA

▲ **Egypt, Alexandria**—BA 2/1—Director General of the Alexandria Municipality Ministry of Municipal and Rural Affairs, Sharie El Tahrir, No. Alexandria, Egypt, sewer project, incl. (1) main connecting sewers (2) raising mains accessories (3) pumping station with electric lines, etc. (4) treatment plant and residence for plant operator. Est. $11,440,000 U. S. money. Plans deposit 120LE. ($344.40).

PROPOSED PROJECTS

WATER SUPPLY

▲ **Mass., Springfield**—City, Bd. Water Comrs., City Hall, approx. 30 m.g. reservoir, at Provin Mountain, Agawam, $3,000,000; bypass water line around intake reservoir, Russell, $1,000,000. Bogart & Childs, 145 E 32 St., New York 16, N. Y., engrs. Constr. 1958.

▲ **O., Akron**—City, Leo Walter, serv. dir., City Hall, Bridge Creek Reservoir, concrete-earthen dam, approx. mile long, 35 ft. high, 300 ft. thick at base, holding 5 billion gals. over 1,500 acres, with 200 ft. long spillway. $2,500,000. Bids this winter. Parsons, Brinckerhoff, Hall & McDonald, 51 Broadway, New York 6, N. Y., consult. engrs. CD 3/23/56.

▲ **O., Elyria**—Bd. Comrs. Lorain Co.; City of Elyria, City Hall, water main, 48 in. force main from Lake Erie to city. $2,500,000. Havens & Emerson, 640 Leader Bldg., Cleveland, Zone 14, consult. engrs.

▲ **Texas**—Bardwell Flood Control & Water Conservation Dist., Ennis, water supply line from reservoir near Ennis, about 30 mi., Corsicana $450,000; water supply line from reservoir near Ennis, Waxahachie $350,000; water supply line from reservoir near Ennis to Ennis city limits, $100,000; water treatment plant to be located at Dam-Reservoir, near Ennis, to supply water to 3 towns, $400,000; Dam-Reservoir for flood control conservation and domestic use on Chambers Creek, Trinity River Tributary, near Ennis $9,000,000.

▲ **Tex., Jacksonville**—Upper Neches River Municipal Water Auth., c/o T. E. Acker, Jacksonville, dam (NE of Frankston) at Blackburn Crossing $7,000,000. water lines carrying water to cities of Palestine, Jacksonville and Rusk, $1,750,000. water treatment plant near dam, $750,000, Anderson, Cherokee, Smith and Henderson Counties. Forrest & Cotton, c/o Vaughn Bldg., Dallas, consult. engrs.

SEWERS, WASTE DISPOSAL

▲ **Ala., Birmingham**—Jefferson Co., Courthouse, Shades Valley and Vestavia-Patton's Creek Sewage treatment Plants. $2,500,000. C. J. Rogers, c/o Courthouse, co. engr.

▲ **Ill., Chicago**—Metropolitan Sanitary Dist. of Greater Chicago, 100 E. Erie St., Northside Sewage Treatment Plant addn., Howard St. and North Shore Channel, Skokie, $5,000,000; Howard St., Niles, Intercepting Sewers, Contr. No. 6, $1,500,000; Upper Des Plaines Intercepting Sewer, extending from W. side of Mount Prospect in Lincoln St., Central Rd., Rholing Rd., Kirchoff Rd., Blockway St. to southern limits of Palatine. Contr. No. 11-d, Cook Co. $1,000,000.

▲ **Mich., Lincoln Park**—City, William Suzors, clk., Lincoln Park, bond election Nov. 5, relief sewers, $2,670,000. Pate & Hirn, 532 Michigan Blvd., Detroit, Zone 26, consult. engrs. CD 7/29.

▲ **Mich., Livonia**—City, Mayor William Brashear, 33001 Five Mile Rd., defeated $10,000,000 bonds Sept. 30, storm drainage project incl. trunk sewer lines Southeast section of city. Hubbell, Roth & Clark, Inc., 954 N. Hunter Blvd., Birmingham, consult. engr. CD 8/5.

▲ **Mont., Missoula**—City, City Hall, interceptor sewerage sys. and treatment facilities. $1,000,000. Clark & Groff, 3240 Triangle Dr., Salem, Ore., consult. engrs.

▲ **N. J., Linden**—City, City Hall, storm sewers in Eighth Ward $1,500,000. Edward Sloboda of Potter Assocs., 50 Church St., New York, N. Y., consult. engr. CD 10/5/45.

▲ **N. D., Grand Forks**—City, City Hall, sewage disposal sys., $3,000,000. Burns & McDonnell, 95th and Troost Sts., Kansas City, Mo., consult. engrs.

▲ **O., Mingo Junction**—Village, Village Hall, $400,000 bond election Nov. 5, sewage disposal system. $1,124,000. CD 5/22/57.

▲ **Ore., West Slope**—City, Sanitary Dist., 3105 S W 89th Ave., voted bonds Oct. 1, sewer imprvs., $1,500,000. Stevens & Thompson, 2234 SW 5th Ave., Portland, Ore., consult. engrs. CD 1/28.

▲ **Pa., Croydon**—Bensalem Twp. Auth., Croydon, sewerage sys. $2,350,000. Glace & Glace, 1001 N. Front St., Harrisburg, consult. engrs.

▲ **W. Va., Weirton**—City, City Hall, 3 stage sewage disposal sys., Phase 1, sewers from Fort Steuben bridge along Ferry Rd. and beyond Cove Lumber Co., plus branches, $4,000,000; Phase 2, interceptions behind Cove Lumber Co. to King's Creek Bowl, $800,000; Phase 3, extension of line to airport and Pa. state line along Harmon Creek, $1,750,000. Alden E. Stilson & Assoc., 245 N. High St., Columbus, O., consult. engrs. CD 8/6.

BRIDGES

▲ **NEW JERSEY**—State Hy. Dpt., 1035 Parkway Ave., Trenton,

Bergen Co.—grade separation on Route 4 at Spring Valley Rd., $1,500,000.

Midland Ave. overpass on Route 17, $600,000.

Cape May Co.—substructure of Cape May Canal bridge on Route 9 and grading approaches, $1,000,000.

Essex Co.—Raymond Boulevard overpass on Route 1 at Newark, $1,500,000.

Hudson Co.—widening approach to Stickel Bridge on Route 25 A, $90,000.

Mercer Co.—Delaware River bridge approach at intersection of Route 29 and Bear Tavern Rd., $2,500,000.

Middlesex Co.—grading separations on Route 1 and Route 18, $2,250,000.

Monmouth Co.—Wampum Brook and Parker's Creek bridges on Route 35, $85,000.

Ocean Co.—Manahawkin Bridge on Route 72, $2,200,000.

Somerset Co.—east and west Raritan River bridges on new Route 202 (Interstate Freeway) near Bound Brook, $5,000,000.

Beden's Brook bridge on Route 206, $210,000.

Peters Brook bridge on Route 28, $150,000.

▲ **UTAH**—State Rd. Comn., State Capitol, Salt Lake City,

Tooele Co.—low overhead on U. S. 40, 3.5 mi. $1,500,000.

▲ **Wash., Seattle**—City, County-City Bldg., Zone 4, second bridge across Lake Washington ship canal in Montlake District $5,000,000. Bids probably next year.

STREETS AND ROADS

▲ **NEW JERSEY**—State Hy. Dpt. 1035 Parkway Ave., Trenton

Atlantic Co.—imprv. Route 322 from Route 50 to McKee City circle, $1,200,000.

Bergen Co.—channelization of Route 46 at Huyler Ave. and closing of island openings in Lodi, $250,000.

Bergen and Passaic Counties—imprv. Route 208 from Harristown Rd. to Goffle Rd., $1,100,000.

Burlington and Camden Counties—imprv. Route 73 from Route 130 to Tacony-Palmyra bridge across Delaware River, $750,000.

Camden Co.—new Route 130 (Interstate Freeway) 3.6 mi. from Camden North-South Freeway to Warwick Rd., $3,000,000.

Cumberland Co.—imprv. Route 77 at Bridgeton, $350,000.

Essex Co.—imprv. Route 21 at Roosevelt Ave. to Highfield Lane in Nutley, $3,500,000.

Gloucester Co.—imprv. Route 45 from Red Bank to Cooper St. $150,000.

Hudson Co.—traffic circle revision at intersection of Routes 1 and 3, $400,000.

Hunterdon Co.—imprv. 3 mi. section of Route 202 east of Flemington traffic circle, $1,500,000.

Mercer Co.—channelization of Bakers Basin and Clarksville Rd. intersection with Route 1 $205,000.

Mercer and Middlesex Counties—resurf. Route 1 from Penns Neck traffic circle to Adams Rd. $2,200,000.

Middlesex Co.—channelization of Route 18-Tice's Lane intersection, $300,000.

imprv. U. S. Route 1 at Ryder's Lane, Raritan River and College Farm Rd., $550,000.

Middlesex and Somerset Counties—imprv. Route 27 from Howe's Lane to Sanford St. $400,000.

Monmouth Co.—imprv. Route 33 from Garden State Parkway to Route 35, $800,000.

Morris Co.—Route 46 3.6 mi. (Interstate Freeway) from Union Turnpike to Mt. Arlington Rd., $7,205,000.

resurf. Route 10 from Salem St. to Route 53, $800,000.

wid'n. Route 10 in Whippany and Livingston, $250,000.

imprv. Route 46 from Bloomfield Ave to Hook Mountain Rd., $225,000.

revision of Route 10 in Randolph Twp., $70,000.

Passaic Co.—imprv. Route 3 from Broad St. to Passaic Ave. in Clifton, $700,000.

dualization of Route 20 from Broadway to Market St. in Paterson, $250,000.

Salem Co.—new Route 130 (Interstate Freeway) 2.4 mi. from Hook Rd. to Springfield Ave. $2,000,000.

reconstr. Route 45 at Market St., $250,000.

Sussex Co.—imprv. Route 25 from Steeny Hill Lake to New York State Line, $750,000.

Warren Co.—revision of Route 56 at Manunka Chunk, $80,000.

new Route 22 (Interstate Freeway) 4.2 mi. from Still Valley to existing Route 22 $6,500,000.

▲ **O., Cleveland**—Comrs. Cuyahoga Co., Court House, Zone 13, wid'n. Wilson Mills Rd. from Richmond to SOM Center Rd., Richmond Heights, Highland Heights and Mayfield, $2,225,000. Harry Gallimore,

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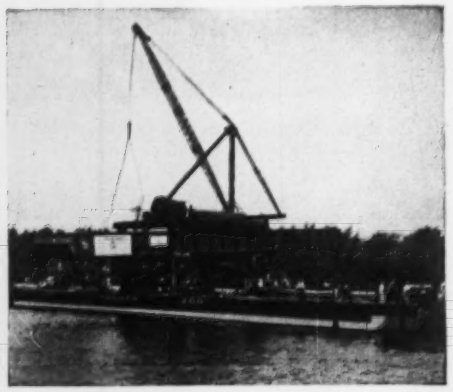

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3482 Lee Rd., Zone 20, consult. engr. Albert S. Porter, Standard Bldg., Zone 13, co. engr. CD 5/14.

▲ **Tex., Grand Prairie**—City, City Hall, voted bonds Sept. 24, street constr. imprvs., paving. $1,100,000. CD 11/6/53.

▲ **UTAH**—State Rd. Comn., State Capitol, Salt Lake City,

Beaver Co.—6.7 mi. from Wildcat Hill to Pine Creek Hill on U. S. 91, $3,000,000.

Box Elder Co.—10.7 mi. from West Brigham City to Elmwood on U. S. 191, $5,000,000.

11.3 mi. Rattlesnake Pass to Snowville on U. S. 30s, $2,900,000.

13.8 mi. Weber-Box Elder Co. line to Junction of U. S. 30 in Brigham City, $8,570,000.

Davis Co.—from Salt Lake-Davis Co. line to North Bountiful on U. S. 89 and 91, $4,200,000, from Layton's south city limits to Davis-Weber Co. line a distance of 8.2 mi., $2,279,000.

Washington Co.—3.7 mi. from Pintura to Ash Creek on U. S. 91, $1,300,000.

from Anderson Ranch to North Pintura, 5.5 mi. U. S. 91, $2,700,000.

from mile south of Ash Creek to the Washington-Iron Co. line, 5.9 mi. U. S. 91, $3,365,000.

EARTHWORK, WATERWAYS

▲ **California**—Dpt. Water Resources, Pub. Wks. Bldg., 1120 N. St., Sacramento, Upper Feather River Basin, 5 multi purpose water Projs., Frenchmen Reservoir, Antelope Valley Reservoir, Dixie Refuge Reservoir, Abbey Bridge Reservoir, Grizzly Valley Reservoir, near Portola, Plumas Co. $5,922,000. CD 9/20/55.

▲ **Calif., San Rafael**—Marin Municipal Water Dist., 874-4th St., realignment of road before proposed dam floods Nicasio Valley, Point Reyes-Petaluma Rd., east of here. $1,000,000. CD 11/13.

▲ **New Brunswick**—Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., deepening of entrance channel dredging training basin at Caron Point, $3,500,000.

▲ **Ont., Toronto**—Dpt. P. Wks., Hunter Bldg., Ottawa, dredging in Toronto harbor incl. dredging approach channel 300 ft. wide from eastern gap to Yonge St., 180,000 cu. yd. rock and 330,000 cu. yd. loose material to be removed from channel to bring it to seaway depth of 27 ft. $2,500,000.

AIRPORTS

▲ **Mich., Muskegon**—AIRPORT IMPRVS.—Bd. Supervs. Muskegon Co., County Bldg., $1,500,000 bond election Nov. 26, county airport imprvs. $4,240,000.

RESEARCH DATA RELEASED BY DUR-O-WAL

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In an effort to obtain pertinent information as to how joint reinforcing actually affects the strength of masonry construction, Dur-O-waL sponsored a program of research carried on by the Research Foundation of the University of Toledo in 1956. The study was designed to provide data on the following items:

1. The relative lateral strength of walls constructed with various types and amounts of reinforcing.

2. The relative effectiveness of various types and amounts of reinforcing used in walls laid up with mortars of widely varying strengths.

3. The effect of deformation in the side rods on the bond in both weak and strong mortars.

4. The effect on bond of the joints formed by the side rods and cross rods.

5. The effect of deforming on the strength of the side rods.

A total of 39 walls, 9'-4" x 4' were built and tested. More than two dozen tension tests were made on plain and deformed wires; 80 pull-out tests were made to determine bond characteristics.

Guide for Comparison

Three points of importance in comparing quality —

1. Weight of material
   a. Comparison of actual weight per 1000 lineal feet.
   b. Flexural strength in relation to weight of steel in wall.
2. Deformation
   a. Report of tests
3. Mortar Locks
   a. Report of comparative tests

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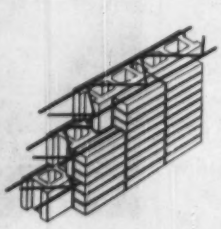
By scientifically combining steel with concrete, architects are provided with new freedom of design and new economy of construction. Dur-O-waL is designed to fill a basic need for an economical, fabricated reinforcing member for masonry walls. You are invited to send for your copy of the research findings to learn how this truss design member provides superior lateral and horizontal reinforcing.



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Advertisement

LATIN AMERICA

▲ **Mexico, El Humaya**—Sria. de Recursos Hidraulicos, Mexico City, plans irrigation dam. $9,600,000.

▲ **Mexico, Tampico**—FACTORY—Dupont de Mexico, Juarez, 117, Mexico City, Mexico, plans chemicals factory (pigment of bioxide of titanium, sulphuric acid, sulphate of ammonia). $3,000,000.

AMERICANS ABROAD

▲ **Iran**—Plan Organization, Govt. of Iran, Tehran, Iran, 460 ft. high Diz Dam in Southwestern Iran, $53,300,000. CD 3/30/56.

PUBLIC BUILDINGS

▲† **Alabama**—PLANT—Tennessee Valley Auth., Sprankles Bldg., Knoxville, Tenn., 500,000 kw. steam generating plant at Widow's Creek near Bridgeport (tentative site) $86,000,000.

▲ **Calif., Hayward**—SCHOOL—Hayward Elementary School Dist., 1099 "E" St., voted $1,800,000 bonds school and bldg. addns. Constr. next spring. CD 10/19/55.

▲† **Calif., Menlo Park**—GEOLOGICAL SURVEY—General Services Admin., 18th and F St. N.W., Wash., D. C., plans by Loubet & Glynn, 400 Montgomery St., San Francisco, Bldg. No. 3 for U. S. Geological Survey, Dpt. Interior. $1,226,000.

▲ **Conn., East Hartford**—SCHOOLS—Town of East Hartford, Town Hall, elementary school, Chester St. $1,250,000; elementary school, Hills St., $1,000,000.

▲ **Conn., Shelton**—SCHOOLS—Town, Town Hall, elementary school, Isinglass Rd., $1,000,000; high school $1,500,000; elementary school Western Sect. Birdseye Rd., $1,000,000; high school addn. $400,000; Sunnyside Elementary School addn. $500,000.

▲ **D.C., Wash.**—SCHOOL—Bd. Educ., 13 and K Sts. N.W., plans by McLeod & Ferrara, 1200 18 St. N.W., Congress Heights High School. $3,400,000. CD 9/19/56.

▲ **Ill., Chicago**—APARTMENTS—Chicago Housing Auth., 608 S. Dearborn St., 189 unit apartment, vicinity 40th and State St. $2,000,000. Bids late 1958.

▲ **Mass., Concord**—SCHOOL—Towns Concord and Carlisle, Supt. Schools, Robert Ireland, Concord, Regional High School, Rte. 2 and Walden St. $2,225,000. Warren H. Ashley, 726 North Main St., West Hartford, Conn., engr. Constr. 1958. CD 2/26.

▲ **Mass., Lakeville**—SCHOOL—Towns of Lakeville and Freetown plans by Israel T. Almy, 56 North Main St., Fall River, Regional High School. $1,540,000. CD 4/24/56.

▲ **Mich., Ann Arbor**—DENTAL, etc.—Regents of University of Michigan, W. K. Pierpont, vice pres., Ann Arbor, dental bldg., $8,895,000; services bldg. and heating plant, $1,700,000, CD 9/20/54; remodeling and addns. to buildings, $1,201,500; new construction $2,225,000; pediatrics unit, $1,219,000; mental research $846,000, CD 12/4/56; materials and metallurgy bldg., North Campus, $5,760,000; mathematics and computing center, $4,185,000; college of architecture, north campus, $4,656,000; School of Education, $4,185,000; medical science bldg., $8,832,000; astronomy bldg. and physics, $1,500,000, all foregoing at University of Michigan.

▲ **Mich., East Lansing**—CIVIL ENGINEERING, etc.—State, A. N. Langius, dir. State Bldg., Lewis Cass Bldg., Lansing, civil engineering bldg. $3,868,000; administration bldg. $3,132,000;
home economics bldg. $2,160,000;
social science bldg. $3,760,000;
chemistry bldg., $3,780,000;
conservation bldg. $4,980,000;
communication arts bldg. $5,832,000;
business administration bldg. $6,480,000, all for Michigan State University.

▲ **Mich., Mount Clemens**—HOSPITAL—Bd. Supervs. Macomb Co. Albert A. Wagner, clk., Mount Clemens, Martha T. Berry Hospital. $1,400,000.

▲ **Mo., Columbia**—HOSPITAL—Boone Co. Hospital Bd. Trustees, Charles H. Trimble, pres. Columbia, plans by O. W. Stigemeyer, 3 Sheraton Dr., St. Louis County, Zone 24, 6 story, bsmnt., 167-bed brick, steel, concrete hospital addn. $3,000,000. Bids in November or December.

▲ **Mo., Sedalia**—MUNICIPAL, etc.—City, $1,150,000 bond election Nov. 5, municipal bldg., $1,000,000.

▲ **N. J., North Brunswick (P. O. North New Brunswick)**—SCHOOL—Bd. Educ., N. Brunswick, Livingston Ave., New Brunswick, plans by Woener & Woener, 103 Bayard St., New Brunswick, 20 room elementary school, Couzens Lane, Adams section of North Brunswick, $1,500,000.

▲ **N. Y., Brooklyn**—SCHOOL—Bd. Educ., 45-12 Crescent St., Long Island City, plans by de Young, Moscowitz & Rosenberg, 205 E. 42 St., New York, Zone 17, Proj. E-399, Junior High School 296, Evergreen Ave., Elbert and Covert Sts. $4,000,000. CD 5/20.

▲ **N. Y., Brooklyn**—SCHOOL—Bd. Educ., Bureau Constr., 42-15 Crescent St., Long Island City, Zone 1, Public School 148 modernization and conversion, Ellery St. between Delmonico Place and Throop Ave. $1,320,000.

▲ **N. Y., Brooklyn**—SCHOOL—Bureau Constr. Bd. Educ., 42-12 Crescent St., Long Island City, plans by S. J. Kessler & Sons, 551 5 Ave., New York, Zone 17, P.S. 297, Park and Marcy Aves., Project E-388, $2,900,000, to go ahead in 1957. CD 5/20.

▲ **O., Middletown**—SCHOOL—Bd. Educ. plans by Goetz & Assocs., 56 S. Main St., and Brandenburg & Switzer, 1035 Central Ave., O., school bldgs. $6,500,000. CD 11/12.

▲ **Tenn., Greenville**—HOSPITAL—State Purch. Dpt., Nashville, plans by Allen Dryden, Kingsport, and Taylor & Crabtree, 1805 Hayes St., Nashville, state mental hospital. $15,000,000. CD 7/15.

▲ **Utah, Ogden**—SCHOOL—Weber County School Dist., 1124 Washington Blvd., voted bonds Sept. 24, school bldgs. $2,500,000. CD 9/4.

▲ **Utah, Provo**—RECEIVING AND TREATMENT—Utah State Bldg. Bd., 419 State Capitol, Salt Lake City, plans by Willard C. Nelson, Box 114, receiving and treatment center for Utah State Hospital. $3,700,000. CD 12/9/54.

▲ **Utah, Salt Lake City**—FAMILY LIVING CENTER—University of Utah, State Bldg. Bd., Glen R. Swenson, dir., 419 State Capitol, Salt Lake City, plans by Scott & Beecher, 617 Dooly Bldg., family living center for University, $5,250,000. CD 1/30/56.

▲ **Alaska, Anchorage**—SCHOOLS—School Bd., Anchorage, voted $5,000,000 bonds Oct. 1, Junior High School $1,875,000; elementary school $848,100. CD 9/24.

Puerto Rico, Mayaquez — TRAINING CENTER — U. S. Atomic Energy Comm. and the University of Puerto Rico, Mayaquez, nuclear training center at College of Agriculture & Mechanical Arts. $2,800,000.

▲ **Alta., Oliver**—LAUNDRY—Alberta Dpt. Health, Parliament Bldgs., Toronto, Ont., laundry bldg. for Oliver Mental Institute, $1,000,000. CD 4/5/54.

COMMERCIAL BUILDINGS

▲ **Calif., Loma Linda**—SANTARIUM, etc.—College of Medical Evangelists, 1720 Brooklyn St., Los Angeles, plans by Heitschmidt & Thompson, 2010 Wilshire Blvd., Los Angeles, sanitarium and hospital addn. $2,600,000.

▲ **Calif., Los Angeles**—TEACHING CLINIC—College of Medical Evangelists, 1720 Brooklyn St., plans by Heitschmidt & Thompson, 2010 Wilshire Blvd., teaching clinic. $2,600,000.

▲ **Conn., New Haven**—GEOLOGY SCHOOL, etc.—Yale University, 119 College St., 8 story geology school, $3,000,000; replacing Woodbridge Hall (administration bldg.) $1,200,000.

▲ **Conn., Windsor Locks**—HOUSES—Spring Park, West St., Windsor Locks, 135 houses, "Spring Park" West St. $2,212,650.

▲ **Fla., Hollywood Beach** — MOTEL, etc. — Charles L. Martell, 10155 Collins Ave., Bal Harbour, motel, swimming pool, Rte A1A. $2,000,000.

▲ **Ill., Arlington Heights**—HOSPITAL—Northwest Community Hospital, 307 N. Bothwell St., Palatine, plans by Skidmore Owings & Merrill, 100 W. Monroe St., Chicago, 1 and 4 story hospital, Central Rd. between State and Wilke Rds. near here. $2,250,000. CD 8/10/56.

▲ **Ill., Chicago Heights**—HOSPITAL—St. James Hospital, Chicago Rd. and 14th St., plans by Gaul & Voosen, 228 E. Superior St., Chicago, 3 story, brick hospital addn. $1,000,000.

▲ **Ind., Frankfort**—HOME FOR AGED, etc.—Northwest Indiana Conference of Methodists, c/o Harold Phend, secy., Monticallo, plans by Alden Meranda, Bd. of Trade Bldg., Indianapolis, Home for Aged, incl. 40-bed hospital, named Wesley Manor. $1,500,000.

▲ **Ky., Louisville**—LIBRARY—Southern Baptist Theological Seminary, 2825 Lexington Rd., plans by Jos. H. Kolbrook, 1565 Starks Bldg., Zone 2, library bldg. $1,900,000. E. R. Ronald & Assocs., 554 S. 3rd St., Zone 2, consult. engrs. Constr. after financing drive. CD 12/16/52.

▲ **N. Y., Buffalo**—SCHOOL—Catholic Diocese of Buffalo, 35 Niagara Square, Bishop Turner High School for Boys, Kerns Ave. near Genesee St. $1,000,000. Bids in January. CD 2/21/56.

▲† **O., Chagrin Falls**—SHOPPING CENTER—Claude H. Whipple, 4095 Warrensville Center Rd., Cleveland, Zone 22, plans by Geo. Howard Burrows, 16104 Kinsman Rd., Cleveland, Zone 20, shopping center, Bell St., to contain 12 to 20 stores with 62,000 sq. ft. space and 30,000 sq. ft. office space on the second floor. $1,500,000-$2,000,000.

▲ **O., Cincinnati**—SHOPPING CENTER—Walter Kunz, Cincinnati-Batavia Pk., Cincinnati (Mt. Carmel) O., shopping center on 40 acre site Beachwood Ave. between Wolfangle and Collinsdale. $4,000,000.

▲ **Pa., Drexel Hill**—HOSPITAL—Delaware County Hospital, Lansdowne Ave., hospital addn. $1,900,000. George M. Ewing, Western Savings Fund Bldg., Phila., engr. CD 2/4/53.

▲ **Pa., Norristown**—HOSPITAL—Montgomery Hospital plans by The Ballinger Co., engr.-archt., 1625 Race St., Phila., hospital addn. $2,000,000.

▲ **Tex., Amarillo**—NURSES HOME, etc.—Citizens Health Council c/o F. V. Wallace, First Natl. Bank Bldg., nurses home, $375,000; main hospital bldg. $2,500,000, 45-acre tract "Medical Center".

▲ **Tex., Beaumont**—HOSPITAL—St. Elizabeth Hospital, (Sisters of the Incarnate Word-Operators) plans by by Pitts, Mebane & Phelps, archts.-consult. engrs., 1872 Calder St., hospital and convent $3,542,210. CD 6/13/56.

▲ **Tex., Fort Worth**—COUNTRY CLUB—E. E. Cloer, 200 Burnett St., plans by Kneer & Hamm, 2509 W. Berry St., constr. Western Hills Country Club, incl. swimming pool, tennis courts and 18 hole golf course, Western Hills, addn. $1,000,000.

▲ **Tex., Houston**—SHOPPING CENTER—Harry W. Hennies, c/o Bunker Hill Lumber & Bldg. Co., c/o Bunker Hill, shopping center about 9700 blk. of Kathy Utilities Rd. $1,000,000.

▲ **Tex., Houston**—OFFICE—J. S. Oshman, c/o Oshman Sporting Goods Stores, 601 Fannin St., remodeling and renovating (old Levy Bros. Co.) store bldg., into an office bldg. $1,000,000.

▲ **Tex., Houston**—MOTOR HOTEL—Morin M. Scott, Montague Hotel, 1031½ E. 7th St., Austin, plans by Winfred O. Gustafson, 1313-A South Congress Ave., Austin, motor hotel. $1,500,000. Walter P. Moore, 2 Pinedale St., consult. engr. CD 7/30.

▲ **Tex., Texas City**—HOTEL—Dee Walker & L. B. Welch, c/o 1st State Bank of Texas City, Texas City, (sponsors) 125 room hotel. $1,500,000.

▲ **Que., Montreal**—ENGINEERING—Bd. Governors, McGill University, Montreal, plans by Fleming & Smith, 1235 McGill College Ave., main unit 8 story, two wings each 5 story engineering bldg., McGill Campus, University and Milton Sts. $2,500,000. McDougall & Friedman, 1235 McGill College Ave., consult. engrs. CD 5/23/56.

▲ **Sask., Regina**—Y. M. C. A. BLDG.—Young Men's Christian Assn., 12th and Cornwall Sts., plans by Black, Larson, McMillan & Assocs., 3 Black Block, Y. M. C. A. bldg., 25x73 ft. swimming pool 13th Ave. between McIntyre and Smith Sts. $1,200,000. CD 4/29/53.

INDUSTRIAL BUILDINGS

▲ **Ark., El Dorado**—CATALYTIC REFORMER—Lion Oil Co., Div. Monsanto Chemical Co., Texas City, Tex., 5,000-bbl. daily capacity catalytic reformer refinery unit. $2,225,000.

▲ **Ill., West Chicago** — EQUIPMENT DISTRIBUTION CENTER—Western Electric Co., 22nd St. and Cicero Sts., Hawthorne Station, Chicago, for equipment distr. center, Hawthorne Lane and Kress Rd. $9,000,000. Site purchased.

▲ **Ind., Indianapolis**—PLANT—Glidden Co., 999 Union Commerce Bldg., Cleveland 14, O., plant to manufacture soybean derived protein. $4,000,000.

▲ **Ky., Coral Ridge**—TUNNEL KILN—General Shale Corp., Coral Ridge, tunnel kiln for Coral Ridge brick plant. $1,000,000. Bids soon.

▲ **Ky., Ford**—STEAM GENERATING PLANT—East Kentucky Rural Electric Co-operative Corp., Winchester, 4th unit, steam generating plant. Total est. $30,000,000. Burns & McDonnell Eng. Co., P. O. Box 7088, Kansas City, Mo., consult. engrs. Constr. spring 1958.

▲ **Pa., Conshohocken**—PLANT—Alan Wood Steel Co., Wood Rd., iron powder plant at Ivy Rock. $3,600,000. CD 12/5/55.

▲ **Tex., San Antonio**—RESEARCH, etc.—Southwest Research Center, 8500 Culebra St., plans by O'Neil Ford & Assocs., 528 King Wm. St., research and education. $1,420,773. CD 4/24/56.

▲ **Va., Hopewell**—PLANT—Allied Chemical & Dye Corp., 61 Broadway, New York, N. Y., caprolactam plant addn.

▲ **Que., Three Rivers**—PLANT EXTENS.—Canada Iron Foundries Ltd., 227 rue St. Maurice, Three Rivers and Sun Life Bldg., Montreal, 2 new machine shops, plant extens., rue St. Maurice. $1,500,000. Constr. 1958.

▲ **Que., Three Rivers**—PLANT EXTENS.—Canadian Westinghouse Co. Ltd., 3350 rue Royale, Three Rivers and 268 Banford Ave. N., Hamilton, Ont., plant extens. at lamp mfg. plant, rue Royale. $2,000,000. Contemplated in 5-yr. program starting 1958.

UNCLASSIFIED

▲ **Ind., Indianapolis**—RAILROAD YARD—New York Central System, G. W. Maxwell, gen. mgr. Southern Dist., electronic classification railroad yard at west edge of Marion Co., on 526 acre site, south of U. S. No. 36 and north of Bridgeport, extending 2½ mi. in east-west direction, in both Marion and Hendricks Counties. $8,000,000.

▲ **Ind., La Porte**—GAS STORAGE CAVERN—Northern Indiana Pub. Serv. Co., 5265 Hohman St., Hammond, 300,000 bbl. LP gas storage cavern in Solid rock to 350 ft. deep, northeast of here. $2,500,000.

▲ **Louisiana**—RURAL DISTRIBUTION LINES, etc.—Southwest Louisiana Electric Membership Corp., Carencro Hy., Lafayette, 382 mi. rural distr. lines and sys. imprvs., Lafayette (La. 9AD Lafayette) $1,030,000 REA loan granted.

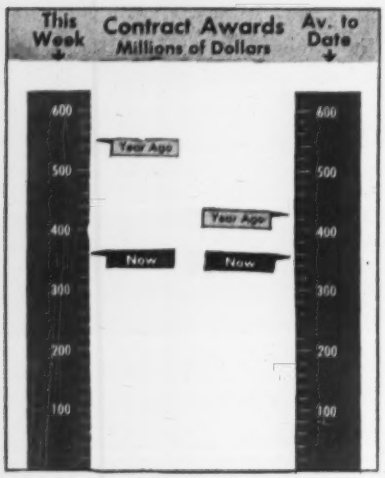
▲ **Nebraska and South Dakota**—TRANSMISSION LINES—Nebraska Generation & Transmission Coop., Columbus (Consumers Pub. Power Dist., Nebraska Pub. Power Sys., Columbus) transmission line from South Dakota line to either Lincoln or Columbus, Neb. from power plant at Missouri River. $5,500,000. R. L. Schacht, Consumers Ch. Eng., Columbus, Neb. P. E. Hampton, Ch. Engr. for Neb. Pub. Power Dist., Columbus, Neb.

▲ **Tex., Arlington-Grand Prairie**—SPORTS CENTER—Great Southwest Corp., 401 Wynnewood Village, Dallas, plans by A. B. Swank, 5611 Cedar Springs, Dallas, sports center between Arlington and Grand Prairie. $10,000,000.

(Proposal Advertisement see pp. 85 to 87)

Construction Scoreboard

Activity this Week



AMOUNT OF CONTRACTS LET

By Ownership	This Week	Cum. 43 wks 1957	Chge '56-'57 %
	millions		
Federal	$16.4	$2,003.7	+38
State and Municipal	129.6	6,225.5	+14
Total Public	146.0	8,229.2	+19
Total Private	213.6	7,187.1	−37
U. S. Total	$359.6	$15,416.3	−16
By Type of Work			
Waterworks	$4.2	$296.5	−2
Sewerage	6.3	459.6	−9
Bridges	8.9	599.8	+17
Highways	49.3	2,555.1	+24
Earthwork, Waterways	20.7	892.1	+39
Buildings:			
Public, Excl. Housg.	43.7	1,938.0	+13
Public Housing	1.1	572.6	+100
Private Housing	64.1	2,563.7	−45
Commercial	27.2	1,440.2	−10
Industrial	44.1	2,708.3	−40
Unclassified	90.0	1,390.4	−9
U. S. Total	$359.6	$15,416.3	−16

NOTE: Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

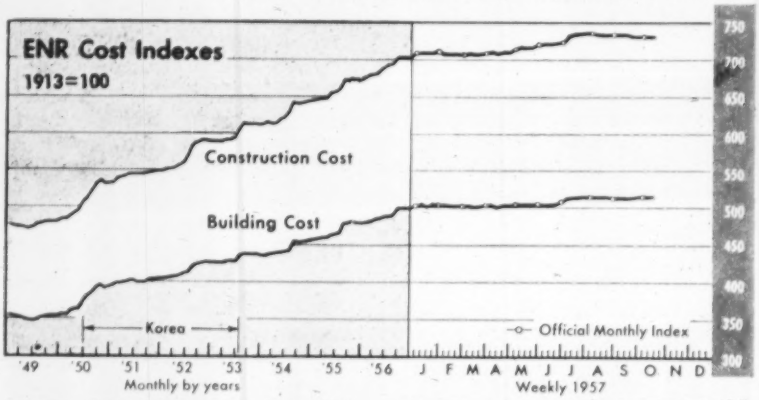
NEW CAPITAL FOR CONSTRUCTION

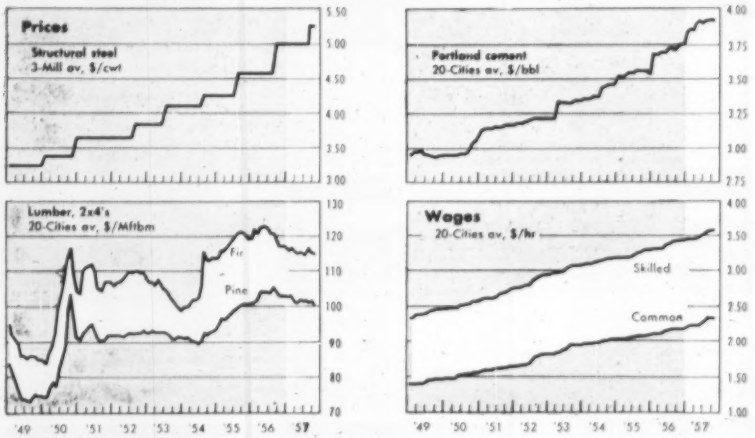
	Week of Oct. 16	Cum. 42 wks 1957	Chge '56-'57 %
	millions		
Corporate Securities	$122.3	$4,793.4	+20
State and Municipal:			
All Except Housing	133.5	4,456.9	+21
Housing	...	155.8	+268
Federal Loans	2.5	174.2	+30
Federal Aid	...	2,161.2	+102
Total Nonfederal	$258.3	$11,741.6	+31
Federal Appropriations:			
In U. S.	...	$2,777.0	−20
Outside U. S.	...	29.0	+82
Total New Capital	$258.3	$14,547.5	+17

Cost Indexes as of Now

ENR INDEXES (1913=100), 20-cities' average	Week of Oct. 17 1957	% Change from Sept. 19 1957	Oct. 18 1956
Construction Cost	736.97	−0.1	+4.7
Building Cost	516.61	+0.1	+3.4

To convert above indexes to 1926=100: Divide Construction Cost by 2.080; Building Cost by 1.850
1949=100: Divide Construction Cost by 4.770; Building Cost by 3.518





ENR COST INDEXES IN 22 CITIES, 1913=100

City	Construction Cost Oct. 1957	Construction Cost Percent Change from last Month	Construction Cost Percent Change from last Year	Building Cost Oct. 1957	Building Cost Percent Change from last Month	Building Cost Percent Change from last Year
Atlanta	548	−0.3	+5.1	456	−0.4	+3.4
Baltimore	670	0	+11.3	520	+0.4	+4.4
Birmingham	563	0	+1.0	469	+0.1	+2.3
Boston	770	−0.5	+3.6	528	−0.5	+4.4
Chicago	837	−0.1	+5.7	529	−0.2	+4.3
Cincinnati	748	−0.4	+4.6	504	−0.6	+2.6
Cleveland	861	0	+4.5	527	0	+2.8
Dallas	547	0	+2.3	451	0	+1.2
Denver	710	0	+4.4	522	0	+3.7
Detroit	831	−0.1	+2.8	545	0	+3.4
Kansas City	742	0	+3.9	516	0	+2.8
Los Angeles	778	0	+6.1	513	+1.0	+3.5
Minneapolis	788	0	+4.1	537	0	+2.2
New Orleans	581	0	+2.7	477	0	+3.7
New York	889	−0.1	+5.3	592	+0.3	+3.7
Philadelphia	773	−0.4	+3.4	559	−0.5	+1.9
Pittsburgh	791	0	+8.8	571	+0.8	+7.1
St. Louis	796	0	+4.7	546	0	+3.5
San Francisco	761	−0.3	+5.2	506	+1.9	+5.4
Seattle	756	0	+4.4	467	0	+3.4
U. S.—20 Cities' average	737	−0.1	+4.7	517	+0.1	+3.5
Montreal	591	+0.7	+4.9	450	−0.5	+2.2
Toronto	609	+0.1	+2.9	471	+0.5	+1.1

THE LONGER LOOK:

HIGHWAY PROGRAM will open up wider commuting and industrial areas with high-speed limited access expressways, but . . .

BOTTLENECKS will get worse in city business districts unless planners find better ways to handle the new swarm of traffic.

New Business—But Also New Problems

The federal highway program will do much more than redraw the roadmap of the U. S. over the next 15 years. It will have a profound impact on the economy—and on the construction industry in particular.

The precise effects are still murky as the highway program gets under way. But, beyond providing a heavier flow of business to highway contractors, it has implications for urban redevelopment, industrial and commercial construction, homebuilding, sewerage and waterworks, rapid transit and other forms of transportation, and the financing of construction.

A few of the things the highway program will do that give it this potential are:

- It will substantially increase total road construction.
- It will bring federal money, on a pay-as-you-go basis through user taxes, into highway financing in a big way.
- It will shift a large share of traffic onto limited access roads.
- It will route through traffic around or across cities and put traffic into and out of the heart of cities on expressways.
- It will make highway travel faster and cheaper and, in general, reduce congestion.

Some of the indirect implications are less obvious. A few of them were discussed recently by L. Jay Atkinson of the U. S. Department of Commerce at a meeting of the American Statistical Association. The highway program, he suggests, will bring problems as well as benefits, especially for the urban areas where half the money will be spent.

Broader commuting areas will be one sure effect of new expressways spreading out from large and middle-sized cities. They will make available for suburban housing developments untapped tracts of land. This will come none too soon, as half-acre sites for single-family homes are becoming scarce in "close-in" locations.

The opening up of new commuting suburbs, of course, means new needs for sewerage, water supply, local roads, schools and churches. And it means new opportunities for commercial enterprises.

Radial networks of expressways also will have an impact on industrial and commercial construction. They make decentralization of factories and warehouses more attractive, with lower land costs and speedy access to central business districts and to suppliers.

Roadside commercial buildings, Mr. Atkinson notes, will follow a different pattern because of expressways and other limited access highways. Instead of stretching along roads in ribbon strips, they will tend to concentrate in areas near interchanges.

The interstate highways in the program will have the primary effect of making intercity transportation by truck and auto faster and cheaper. The increase in such traffic will be partly at the expense of competing carriers, particularly railroads.

Furthermore, the interstate system puts a new complexion on turnpikes. It cuts sharply the need of additional toll-financed roads. And where new free interstate roads offer good alternative routes, the interstate system may reduce truck revenues of existing turnpikes. Just how the turnpikes will be related to the federal interstate system is, however, still an unsettled question.

Speedier highway transportation will by no means be an unmixed blessing for urban centers. In fact, it threatens to aggravate the congestion that already is throttling the growth of many cities.

A broadening commuter area, for instance, means a likely increase in commuting by private passenger car. This will put an added burden on local streets and parking facilities. Even if more is done to provide offstreet parking and to increase traffic flow through overpasses and one-way streets, prospects for significant improvement are not bright.

The new highways also will bring more truck traffic into city business areas, though this can be restricted and localized to some extent. At any rate, cities will have to cope with heavy commercial vehicles to a greater degree than at present.

Mr. Atkinson suggests that, to utilize the new highways effectively, the cities must provide better mass transportation for commuters. Most rapid transit systems now suffer from "financial and rider apathy" and are losing business. Introduction of the monorail, helicopter and moving sidewalks are still generally regarded as visionary.

Mr. Atkinson warns that without urban planning, the new highway program will add to business district congestion and become so severe as to impair continued growth. Such planning cannot be delayed long.

(B&F continued on page 78)

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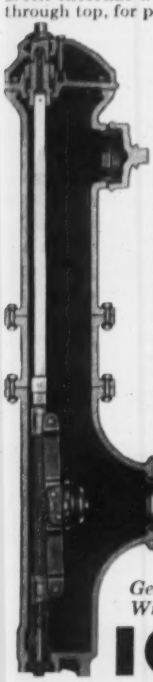

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Construction Markets

St. Louis: An On-the-Spot Report

The construction picture in St. Louis generally is painted with bright colors. But it also is admitted by some municipal government officials and segments of the building industry that a few somber colors are worked in among the gold and silver ones. The darker hues represent the small ratio of private work to public work and it generally is conceded that the market would be healthier if a larger percentage of private work were more apparent.

For the rest of this year and into 1958, the big jobs will develop in the public works category. And the strongest item in this group will be highways.

At the moment, major construction activity centers around a system of three radial expressways that are dedicated to relieving the city's traffic snarls. Two of the units, the Mark Twain and the Daniel Boone Expressways, are under construction. The third one, the Ozark, only recently got beyond the talk-and-hassle stage.

Proposed as a 6 lane, 15 mi route from the Mississippi riverfront in downtown St. Louis to Lindberg Boulevard in St. Louis County, the $43.9 million project had been opposed for several years by the Board of Aldermen, who refused to approve its route.

But following a recent meeting with the city's mayor, the State Highway Commission announced that it would move ahead with a detailed survey and take steps to acquire right-of-way without action of the city fathers of St. Louis.

Now under contract is $29 million in work on the Mark Twain Expressway. Before the end of this year, the Highway Department expects to place a 4½ or 5 mi segment under contract at an estimated cost of $12 million. Sometime in the spring, the department plans to let another $4 million section.

During the fiscal year ending June, 1956, the department let $16.5 million in St. Louis area contracts. In fiscal 1957, the total jumped to $30.5 million and in fiscal 1958, the amount is expected to leap to above $40 million.

Public housing also is expected to add to the work volume during the next eight months when two jobs totaling $15 million may be let. In addition, the city is spending funds from a 1955 bond issue for various types of construction work at the rate of about $12 million annually, a pace that will carry through 1960-61.

The Metropolitan St. Louis Sewer District will also add its weight to the dollar total, through the extension and modernization of sanitation facilities. During the next four months, $1 million in new work will be let and another $8 million is now on the boards.

Appropriately enough, in the spring when new things bloom and glisten, a section of the city will get another chance with the possible start of a $16 million apartment project to be constructed by the Urban Development Corp. of St. Louis. This body already has agreed to pay $920,000 for a large plaza area near the city's center.

Among the weak spots in the city's construction economy is private housing. In the city proper and St. Louis County, starts for the full year of 1957 are expected to tally "under 5,000." This figure is in sharp contrast to 11,000 starts in each of 1954 and 1955 and 7,083 starts in 1956.

However, the Homebuilders Association of Greater St. Louis is hopeful that from out of the recent successful National Home Week promotion will come sales.

There are some indications that actual construction activity has slackened, although architects and leaders in heavy construction report that they now have all the work that they can handle.

The slackening is apparent in the labor market, which, perhaps, has been most affected by the sharp housing slump. Joseph Cousin, executive secretary of the Building and Construction Trades Council, estimated that in mid-September 6,000 to 7,000 construction workers were unemployed in the area.

Despite the building trades unemployment, Mr. Cousin was optimistic about prospects for the next few months and the Missouri Division of Employment Security said new jobs are developing and unemployment generally is on the decline in comparison to last year.

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Policy Changes

Competitive bids asked of Canadian government

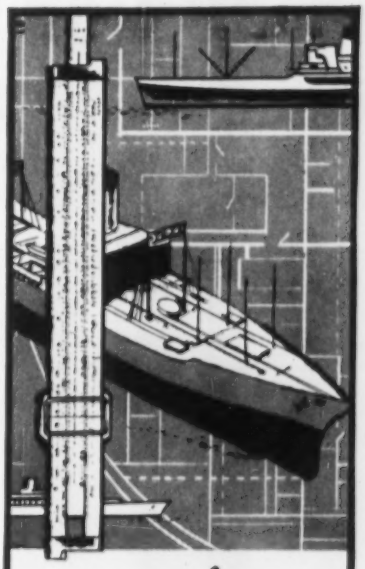
The Canadian Construction Association has asked the Alberta government to change some of its construction policies. The group represents 65 Alberta firms and 5 affiliated construction associations.

The association asked the government to:

- Put more government construction work on a competitive bid basis and encourage municipalities to do the same. The association claims that having construction work done by government personnel is in conflict with the province's policy of encouraging private enterprise.
- Insert "fair wage" schedules in provincial contracts. This request reflects problems in several areas over differences in federal and local requirements for working conditions. The association urged the government to make the requirements conform to the practices of the province in which the job is located.
- Continue promotion of wintertime construction by scheduling work and material purchases for winter.
- Speed up progress payments and the release of holdbacks and security deposits, thereby eliminating unnecessary tie-ups of a contractor's working capital.
- Accept responsibility for accuracy of sub-soil reports. Many government contracts do not do this, the association stated, despite the reliability of present scientific techniques. Bidders, therefore, must make allowance for possible inaccuracy in their bids. If the government would follow private contract practices and back sub-soil surveys, renegotiating where substantial inaccuracy was found, these allowances could be eliminated.
- Limit over-runs and under-runs of the amounts included in the bidding documents to 15% on unit price contracts.

The association noted that the physical volume of construction work in Canada has risen to a new record in each of the post-war years. It predicted that activity would reach $6.9 billion in 1957 and provide employment directly in construction for 600,000 persons. In Alberta alone, $700 million will be spent on construction this year and 56,000 persons will be provided work in construction. Alberta's construction volume for the year will be the highest per capita expenditure of any Canadian province.

(B&F continued on page 79)



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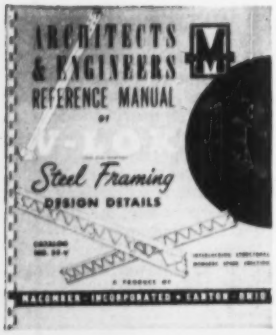

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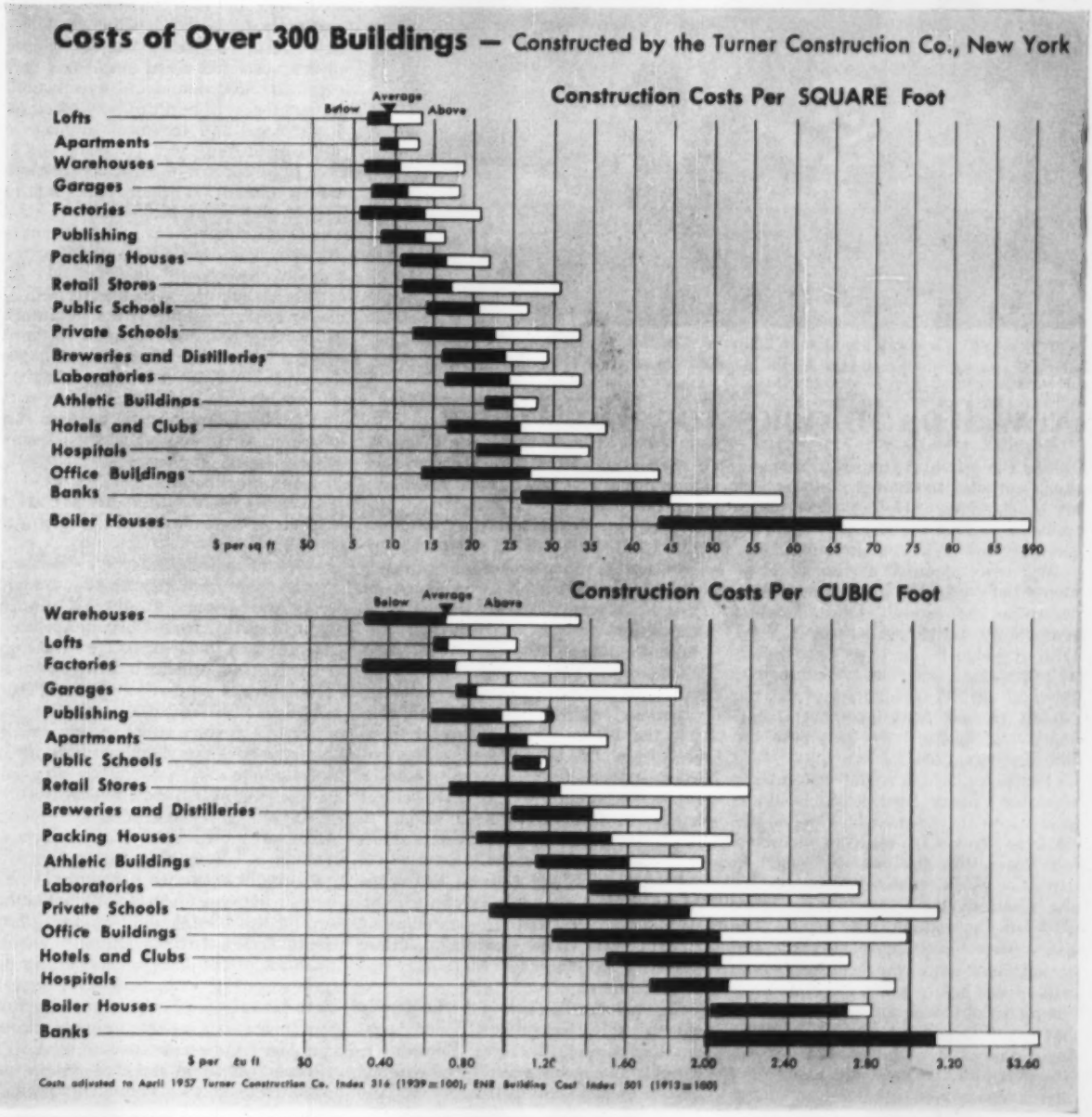
Milwaukee Ready to Start On $54 Million Water Plan

The city of Milwaukee has notified its consultants to proceed with surveys and preliminary design of some $35 million worth of a $54 million expansion of the city's water system. Subsequently, Black & Veatch of Kansas City, Mo., is to provide final plans, specifications.

First phase work, to be constructed in five years, includes an intake and crib in Lake Michigan, a raw water pump station and a filtered water pump station. Lloyd Knapp, Milwaukee commissioner of public works, said preliminary design is to be completed in six months.

Correction — 1957 Cost Issue

Because of errors in scaling made in the ENGINEERING NEWS-RECORD offices, the chart on page 278 of the ENR October 17, 1957 Annual Cost Issue is incorrect. The corrected chart is shown below. This is the exact size of the original chart, it can and should be pasted over the incorrect chart on page 278 of the cost issue



ATTORNEYS Thomas J. Dodd and Godfrey P. Schmidt, representing rebellious teamster members, successfully persuade a federal judge in Washington, D. C., to set up . . .

New Roadblocks for Mr. Hoffa

Like the gift to Midas, whose magic touch put what he wanted most beyond his reach, James Hoffa's election as teamster president is fast proving to be an empty and perhaps disastrous victory.

In a series of quick moving developments last week, Mr. Hoffa's hard won access to the union's top office was temporarily snatched away by Federal District Judge F. D. Letts, who issued a restraining order in Washington, D. C., against inauguration of the Miami elected teamster officers. Mr. Hoffa had planned to take over the presidency on Oct. 15.

The order, which is only one of the teamsters' many legal headaches, was granted on the petition of 13 rank and file New York City teamster members, who claim the election was rigged to assure a Hoffa victory. Attorneys for the dissident members contend some 80% of the union's convention delegates were improperly elected and seated. This week, the teamsters union will appear before Judge Letts to argue the merits of having the order rescinded, but it still faces legal disposition of the basic charge that the convention was illegal and of the rank and file request that a court master be put in charge of the union until the issue is resolved.

At the same time, the Senate Select Committee is turning over for court use the convention records it subpoenaed from the teamsters' Credentials Committee (ENR Oct. 17, p. 384) and is obtaining from teamster locals around the country evidence on their election of delegates and on their convention expense accounts.

Confounding the teamsters'—and labor's—problems, is mounting talk of repressive union legislation, including a national right-to-work law; growing defection of rank and file teamster members from the Hoffa leadership; and what appears to be a comprehensive Internal Revenue check of union officer federal income tax returns. Added to this is Mr. Hoffa's personal implications with the law in New York City, where a federal court will rule on Friday on Mr. Hoffa's request for indefinite postponement of a trial on wire tapping charges. Mr. Hoffa claims the atmosphere is too "hostile" for a fair trial at this point.

Against this background, the powerful AFL-CIO Executive Council meets in Washington, D. C., on Thursday to decide the crucial question of whether the teamsters union should be suspended from the federation.

Engineers Map Union

Steering committee puts ESG closer to reality

Formation of Engineers and Scientists Guild moved a step closer to reality over the weekend of Oct. 12 when the group's steering committee met in Los Angeles to consider a proposed constitution.

Committee members were in general agreement on the constitutional aims and purposes of ESG, which will be a new national collective bargaining force of engineers and allied employees dedicated to the economic advancement of its members. But still to be worked out is the legal and technical language of the constitution and a budget acceptable to prospective member associations, which include in their representative jurisdictions some 22,000 engineers and engineering employees in private industry and in municipal and other governmental agencies.

Nearly half the membership will be comprised of groups that splintered from Engineers and Scientists of America last May, when ESA put the accent on professionalism by voting to exclude technicians, draftsmen and others without academic engineering degrees. The rebel faction contended this move served to de-emphasize the collective bargaining function of ESA, and as a direct result sought to form ESG to include both professional and technical people.

The remaining 11,000 members would come from Engineers and Architects Association, a Southern California group expelled from ESA in April in a dispute over assessments.

At the Los Angeles meeting, a future conclave was set tentatively for Feb. 7 and 8 in New York City, where a final draft of the constitution is expected to be approved for later ratification by local groups.

Under the proposed constitution, ESG will be a "federation of representative organizations of engineering associations, representing engineering employees for collective bargaining." ESG would not bargain in its own name but would assist local and regional groups in their collective bargaining.

None of the delegates to the Los Angeles meeting expects ESG to spring into being as a labor powerhouse. Present plans call for an annually elected president and six directors to serve without compensation and to maintain only volunteer offices. Permanent election isn't likely to occur until a founding

convention meets, probably in mid-1958. Meanwhile, indications are that the February meeting will be largely concerned with budget problems. Most of the present sponsors favor a national assessment of 50 cents a man a month to amass quickly an emergency or strike fund and to accumulate money for research into organizational problems, publicity and membership. Some already have called the proposed contribution too steep.

Although no fast line has been drawn on which groups ESG will represent in the final analysis, there was agreement to limit membership to those directly associated with an engineering function. It would not include clerical and administrative personnel. Termed as likely targets in future membership drives are "any engineering associations of like interests," to ESG.

Among the delegates and observers attending the Los Angeles meeting were engineers representing employee groups at the Los Angeles Department of Water and Power; the City of Los Angeles; Tennessee Valley Authority; Woodward, Clyde, Sherard and Associates; Pacific Gas and Electric; and Chicago and Northwestern Railroad.

Heading up the ESG steering committee as chairman and vice chairman are Charles Hall, New York electronic engineer who is president of Sperry Gyroscope Engineers Association, and Stanley Nelson, president of Engineers and Architects Association.

Bid Shopping Bill Is Criticized

Several AFL-CIO building trades unions join forces with subcontractors to stymie pending legislation

An example of labor-management cooperation of significant potential has emerged out of subcontractor and building trades criticism of the anti-bid shopping bill now before Congress.

Opponents of the legislation say the bill is a "misnomer" and that it "actually legalizes" instead of prevents bid-shopping.

Five of the national subcontractor associations and three of the international AFL-CIO unions that have already committed themselves to opposing the bill have formed an informal working committee known as the Construction Subcontractor Trade Group.

At a meeting in Washington, D. C., on Oct. 14, the committee solidified its position in a five-point indictment of the pending legislation. Meanwhile, a joint statement defending the legislation was issued this week by officials of four other specialty trade groups that recently participated in the formation of an equally significant industrial alliance called the National Joint Cooperative Committee of the Associated General Contractors and the Council of Mechanical Specialty Contracting Industries (ENR Oct. 3, p. 19).

Known as H.R. 7168, the bill endorses the single contract system of procurement and requires that each major category of mechanical specialty work be listed separately in specifications prepared by contracting agencies. Original definition of mechanical specialty work included such items as plumbing, heating, etc., up "to a point five feet outside the building line." When the general contractor submits his bid, the bill requires him to submit the names of his specialty contractors but allows him five days after the bids are opened to engage different subcontractors or to agree to perform the work himself. The bill was passed by the House and was favorably recommended by the Senate Judiciary Committee after deleting the five foot limitation.

In its indictment of the bill, the Subcontractor Trade Group made these points:

- It disagrees with the Congressional view that the single contractor system of awarding federal construction contracts is preferable to a separation of bids. The approach conflicts with that of nine states which have saved the taxpayers money by requiring separation of bids.
- The bill affects all subcontractors and the present "bid-peddling" limitation to the mechanical trades should be broadened.
- The five-day grace period for naming subcontractors actively promotes bid shopping.
- The five-foot building line rule is highly prejudicial and unrealistic and must be removed by the House as well as the Senate.
- It should be "clearly and unequivocally specified" that any money saved by the general contractor in bid shopping should revert to the government.

Unions that strongly fear the jurisdictional and job loss implications of the bill and that are supporting the Trade Group position are the United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry, the Brotherhood of Painters, Decorators and Paper Hangers of America, and the Wood, Wire and Metal Lathers International Union. Present contractor association supporters are the National Association of Plumbing Contractors, Contracting Plasterers International Association, Tile Contractors Association of America, National Terrazzo and Mosaic Association, and the Painting and Decorating Contractors of America.

In defense of the bill, the presidents of the National Electrical Contractors Association, Mechanical Contractors Association of America, Sheet Metal and Air Conditioning Contractors' National Association, and Council of Mechanical Specialty Contracting Industries this week urged adoption of the bill as amended by the Senate Judiciary Committee. They declared that the measure will not encourage bid shopping and specifically condemns such conduct as an "unfair trade practice." They feel that the five-foot provision is now a dead issue, that the bill will not affect state contracting procedures, and that it does not establish a single contract system for federal construction. "This bill," they said, "gives the subcontracting industries the valuable protection of subcontractor listing where a single contract is to be let. It does not restrict separate contracts. . . . The present form of bill represents the joint thinking of the leaders of the entire industry . . ." and, they add, the AGC has "publicly stated" it will "use all proper means" to curb bid shopping and that it will not oppose reasonable amendments if the five-day grace period is abused.

The joint labor-management trade group opposing the bill in its present form estimates that at least 10 subcontractor groups and their respective craft unions will actively oppose Senate passage next year.

Labor Briefs . . .

- **Right-to-work**—Fanning current interest in right-to-work legislation, a California county court has ruled that Trinity County's new right-to-work ordinance does not violate the Taft-Hartley Act. Issue before the high court is whether Congressional authorization to pass such laws extends to political subdivisions of a state.
- **Union merger**—Formation of the Delaware State Labor Council this month marked the 30th merger of AFL and CIO forces at state levels.

OFFICIAL PROPOSALS

Bids: October 31, 1957.

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, Canal Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., eastern standard time on the 31st day of October 1957, by Henry A. Cohen, Director, Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 1, G. L. Nickerson, District Engineer, 353 Broadway, Albany 1, New York						
Albany (Rte. 9)	RC 57-172	Loudon Pt. 2, S.H. 119 Loudon-Crescent S.H. 5555	1.75	Asphalt Concrete = 1.67 mi. Misc. Work = 0.08 mi.	$36,000 Plans $10	$672,000
Schenectady	FAC 57-18 FASH 57-20	City of Schenectady: Crosstown Conn. Schenectady Crosstown Conn. Pt. 2 Proj. U-323(12)	2.14 (0.88 Acc.)	9" Cem. Conc. Pavt. 48' var. wide = 2.51 mi. Asphalt Concrete = 0.28 mi. Misc. Work = 0.23 mi. 1 Hwy. Sep. Comp. I-Beam 60'	$102,000 Plans $25	$1,847,000
DISTRICT No. 2, L. Ketchum, District Engineer, 109 No. Genesee St., Utica 1, New York						
Montgomery & Oneida	M 57-10	Barge Canal Terminal at Utica Barge Canal Terminal at Fonda	0.44	7' Wire Mesh Fencing and Gates	$600 Plans $10	$10,400
DISTRICT No. 5, E. G. H. Youngmann, District Engineer, State Office Bldg., 65 Court St., Buffalo, New York						
Erie	FAC 57-19	City of Buffalo: Kensington Expressway Sect. 1, Arterial Project U-377(13)	1.73	Demolition of Buildings	$32,000 Plans $10	$573,000
Niagara	FARC 57-173 FAC 57-20 FASS 57-15	Sanborn-Lockport, S.H. 9094 City of Lockport: East-West Arterial Route (West Avenue Section) City of Lockport: Upper Mountain Road Arterial Upper Mountain Road Project F-U-709(7); S-US-USG-474(1)	3.81 (0.50 Acc.)	Asphalt Concrete Ty. 2A = 4.26 mi. Misc. Work = 0.05 mi. R.R. Sep. Plate Girder 77'	$140,000 Plans $50	$2,515,000
DISTRICT No. 7, R. W. Sweet, District Engineer, 444 Van Dusee Street, Watertown, New York						
Clinton & Essex (Rtes. 9, 9N & 22)	FARC 57-166	Clintonville-Keeseville, S.H. 651 Keeseville-Ausable Chasm, S.H. 5056 Keeseville Village, S.H. 859 Project F-876(4), F-407(9)	1.23	Asphalt Concrete Ty. 1A = 1.18 mi. Misc. Work = 0.05 mi. Prestress Conc. Br. 75.5'	$45,000 Plans $15	$804,000
Clinton	FASS 57-14	Picketts Corners-Chazy Lake Road, Pt. 2 Project S-437(1)	5.94	Bituminous Surface Treated Gravel	$22,600 Plans $25	$410,000
DISTRICT No. 8, K. G. Rauer, District Engineer, Pleasant Valley Road, Poughkeepsie, New York						
Westchester	FICWE 57-1 HRPRC 57-1 FINETC 57-4	Interstate Route Connection No. 520 Cross Westchester Expressway (Rye Sect.) Hutchinson River Parkway, New York State Thruway-New England Sect. Sub. NE5 (Interchange with Cross Westchester Expressway) Project I-1101(4), I-1068(17)	5.95 (8.95 Acc.)	9" Cem. Conc. Pavt. 2 @ 36' Var. Wide = 13.99 mi. Asphalt Concrete = 0.91 mi. 1 Hy. Sep. R.C. Rigid Frame 146.2' 8 Hy. Seps. Comp. I-Beams 177.5', 187.8', 161.5', 206', 176.5', 179.3', 267', and 255.8' 1 R.C. Triple Box Bridge 55.3' 1 R.C. Twin Box Bridge 33.5' 1 Hy. Sep. Comp. Weld. Girder 358.1' 1 R.R. & Hwy. Sep. Comp. Beam and Girder 294.7'	$850,000 Plans $100	$15,500,000

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal-Aid Highway Act of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage) Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal.

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Instructions to Bidders".

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

Bids: November 6, 1957.

Cable Guide Railing and Wire Fencing Contract 448

SEALED BIDS will be received by the Board of Water Supply at its offices, thirteenth floor, 120 Wall Street, New York City until 11:00 A.M. Eastern Standard Time on Wednesday, November 6, 1957, for Contract 448, for furnishing, delivering and erecting about three miles of cable guide railing and about four miles of wire fencing, including gates; the removal and disposal of about 2,700 feet of existing railing and fencing, and the repairing and rehanging of certain existing gates are also included in the work to be done under this contract. The proposed work is located along the Delaware system in Delaware, Sullivan, Ulster, Orange, Dutchess, Putnam and Westchester counties, New York.

Pamphlets of the contract containing information for bidders, forms of bid and contract, specifications, contract drawings, requirements as to surety, etc., can be obtained in the Secretary's office, Room 1312 at the above address, upon application in person or by mail, by depositing the sum of $5.00 for each pamphlet. Within 30 days following the award of contract or rejection of bids the full amount of such deposit will be refunded for each pamphlet submitted as a bid and a refund of $4.00 will be made for each other pamphlet returned in acceptable condition. Arrangements will be made whereby prospective bidders desiring blueprints of the contract drawings for their use may secure same, the cost thereof to be paid by them.

ARTHUR C. FORD, President, EDWARD C. MAGUIRE, HERBERT M. ROSENBERG, Commissioners; Board of Water Supply; BETTY COHEN, Acting Secretary.

Bids: Oct. 30, 1957.

Triborough Bridge and Tunnel Authority

SEALED BIDS WILL BE RECEIVED BY Triborough Bridge and Tunnel Authority at its office, Administration Building, Randall's Island, Manhattan, New York 35, N. Y., as follows:

Until 11 A. M. on Wednesday, October 30, 1957.

For Throgs Neck Bridge Contract No. TN-4A, Bronx Anchorage Foundation and Superstructure. The bid must be accompanied by a deposit in the amount of $250,000.00.

and

For Throgs Neck Bridge Contract No. TN-4B, Queens Anchorage Foundation and Superstructure. The bid must be accompanied by a deposit in the amount of $300,000.00.

Foundations will be open dredged caissons located in East River, in the City of New York.

Bidders may submit bid for either one or both of the above contracts.

Plans, specifications and contract documents may be purchased at the office of the Authority for $30.00, which will not be refunded.

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OFFICIAL PROPOSALS

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SEND COPY: to Official Proposal Division, Classified Adv. Div., P. O. Box 12, New York 36, N. Y.

OFFICIAL PROPOSALS

Bids: November 2, 1957

Empresa Electrica "Quito" S. A. Quito, Ecuador

INVITATION
NOTICE

This is to advise construction firms and companies legally established in their country of domicile that Empresa Eléctrica "Quito" S. A. will call for proposals for the construction of the civil engineering works for the new Cumbayá hydroelectric project with a total capacity of 40,000 kilowatts.

For this purpose the present invitation is made in order that national and foreign companies or firms, domiciled within or without Ecuador, that are interested in submitting a proposal may obtain from our offices in Quito or from the offices of R. J. Tipton Associated Engineers, Inc., of Denver, Colorado, U.S.A., the documents necessary to establish their qualifications and solvency, which are indispensable requirements of being classified as qualified to take part in the bidding. Consequently only firms so classified can present proposals.

The construction firms and companies interested in presenting their qualifications may, on or before 10 a.m. 2 November 1957 obtain the Invitation Documents upon deposit of Five Thousand Sucres (S/5,000.00) in cash with the Cashier of Empresa Eléctrica "Quito" S. A., in Quito, Ecuador, or its equivalent in U. S. Dollars ($330.00 US) with R. J. Tipton Associated Engineers, Inc., of Denver, Colorado, U.S.A. This deposit will be returned only upon the return in good condition of the Invitation Documents made available by Empresa Eléctrica "Quito" S. A.

These firms or companies are authorized to visit and make investigations of the terrain in which the Cumbayá Project is to be situated, and to solicit any supplemental information; but the Empresa Eléctrica "Quito" S. A. will not recognize nor be responsible for the cost and expenditures that are incurred by those interested.

Richard Espinosa P.,
General Manager.
Eduardo Pólit M.,
Chairman of Board of Directors,

Quito: 10 October 1957

Bids: November 12, 1957

Sewers and Sewage Treatment Work

Sealed bids will be received by the Cinnaminson Township Sewerage Authority at the Cinnaminson Memorial School in the Township of Cinnaminson, New Jersey, until 8:00 P.M., Prevailing Time, on Tuesday, November 12, 1957 for the furnishing of all labor, materials and equipment for the construction of sewerage facilities including 2 Sewage Treatment Plants, 2 Sewage Pumping Stations and 97375 L.F. Sanitary Sewers and Force Mains.

At the above time and place bids will be publicly opened and read aloud.

The Cinnaminson Township Sewerage Authority reserves the right to reject any or all bids or to make award to such bidder, who, in the judgment of the Cinnaminson Township Sewerage Authority, makes the most advantageous proposal.

Each proposal must be accompanied by a certified check or bid bond drawn to the order of the Cinnaminson Township Sewerage Authority, in the amount of at least five percent (5%) of the bid price, with the understanding that the bid security of the successful bidder will be forfeited to the Cinnaminson Township Sewerage Authority as liquidated damages in case of failure of such bidder to enter into a contract for the execution of the work within ten (10) days after written notice so to do has been served upon him by the Cinnaminson Township Sewerage Authority.

Plans and specifications may be examined at the Office of the Consulting Engineer, A. C. Jones Associates, 223 High Street, Mount Holly, New Jersey, during ordinary business hours or may be obtained from said Consulting Engineer upon deposit of the sum of Fifty Dollars ($50.00) which deposit will be refunded to bona-fide bidders upon return of these documents in good condition within ten (10) days after award of contract. Persons who take out plans and specifications and do not follow through with an official proposal will be entitled to only one-half refund when the documents are returned.

BY ORDER OF THE CINNAMINSON TOWNSHIP SEWERAGE AUTHORITY.
Ruth K. Maher, Secretary

October 7, 1957

Bids: Nov. 7, 1957

Soil Explorations and Foundation Investigations

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 a.m. Eastern Standard Time, on November 7, 1957, by Henry A. Cohen, Director, Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for:

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES ON INTERSTATE ROUTE 512; CLOVE LAKES EXPRESSWAY, GOETHALS BRIDGE APPROACH TO WEST END OF NARROWS BRIDGE APPROACH, PROJECT I-1066(18), RICHMOND COUNTY, WHICH CONSTITUTES CONTRACT NO. SPEC. FA-SM-105.

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, N. Y.
(b) Mr. M. E. Goul, District Engineer, New York State Department of Public Works, 325 West Main Street, Babylon, Long Island.
(c) Mr. William M. Trainer, Associate Contract Engineer, Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $5.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50 percent of deposit.

The Engineer's Estimate of cost for this work is $21,900.00.

Proposal for this contract must be submitted in separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of $1100.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instruction to Bidders."

The right is reserved to reject any or all bids

J. W. JOHNSON
SUPERINTENDENT OF
PUBLIC WORKS

Bids: Nov. 6, 1957

The Port of New York Authority New York International Airport Roadway By-pass Contract NYA-960.001

Sealed proposals for construction of a roadway by-pass at New York International Airport will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Wednesday, November 6, 1957, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Design of the Authority, Room 1115. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1061, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, October 24, 1957

Bids: November 8, 1957.

Galeton Borough Authority

SEALED PROPOSALS will be received by the GALETON BOROUGH AUTHORITY at the office of the said Galeton Borough Authority, Community Bldg., Sherman St., Galeton, Pennsylvania, until 8:00 P. M. (E. S. T.), on the 8th day of November, 1957, for the furnishing of all necessary labor, materials and equipment, and for the performance of all work for the (1) General Construction of a Sewage Treatment Plant; and/or (2) Electrical Construction of the said Sewage Treatment Plant; and/or (3) General Construction of Intercepting Sewers and other Sewer Facilities, in the Borough of Galeton, Pennsylvania. Proposals will be publicly opened and read at the above appointed time and place.

Each proposal must be accompanied by a certified check, bank cashier's check, treasurer's check, or by a bid bond executed by a corporate surety qualified to do business in the Commonwealth of Pennsylvania, drawn to the order of or naming as obligee the GALETON BOROUGH AUTHORITY, and in an amount not less than Five per centum (5%) of the base bid, as a bid guaranty; Provided, however, that the maximum bid guaranty shall be Five Thousand ($5,000) Dollars for each bid submitted.

Copies of the Contract Documents, including bid proposal forms and the plans and specifications, may be obtained at the office of HILL & HILL, Engineers, 8 Gibson Street, North East, Pennsylvania, or from the Secretary of the Galeton Borough Authority, Community Bldg., Galeton, Pennsylvania, upon the deposit of Thirty ($30.00) Dollars for each set. A refund will be made in full to bona fide and actual bidders upon the return of one set in good condition within five (5) days after the date for the receipt of bids. A refund for the return of all other sets in good condition within the same period will be in the amount of Fifty per centum (50%) of the deposit.

No bid may be withdrawn for sixty (60) days after the date for the receipt and opening of bids as above set forth.

Successful bidders will be required to furnish surety bonds and evidences of required insurance coverage in the amounts and at the time as set forth in Information for Bidders and in the General Conditions.

Galeton Borough Authority reserves the right to reject any or all bids, or to accept or reject any part of any bid, and to waive any informalities in any bid.

GALETON BOROUGH AUTHORITY
By: B. E. Kramer.

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4983) will be received at Yuma, Arizona until 10 a.m. Pacific Standard Time November 14, 1957, for furnishing labor and materials for Wash Overchutes, Welton-Mohawk Canal. Stations 660+00 and 661+16, Gila Project, Arizona. Location near Yuma, Arizona, in Yuma County. Principal items are 41,500 cu. yds. excavation; 1,350 cu. yds. concrete; and other work. Completion time 200 days. For particulars, address Bureau of Reclamation, Bin 151, Yuma, Arizona; Boulder City, Nevada; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4982) will be received at Albuquerque, New Mexico until November 13, 1957, for furnishing labor and materials for Earthwork and Structures, Atrisco Feeder Canal, North Reach Extension, Middle Rio Grande Project, New Mexico. Location near Bernalillo, New Mexico. Principal items are 315,000 cu. yds. excavation for canals; furnish and install 420 feet of corrugated metal pipe; 76 cu. yds. of concrete; and other work. Completion time 140 days. For particulars, address Bureau of Reclamation, P. O. Box 252, Albuquerque, New Mexico; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

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Young civil engineer interested in broad application of civil engineering.

Excellent opportunity with consulting firm. Liberal benefit plans and good working conditions. Location Middle West.

Send resume of education and experience with salary requirements to:

P-8228, Engineering News-Record
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CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

Superintendent experienced in heavy sewer & water main construction under difficult conditions, by N. Y. State Contractor. Permanent position for qualified, responsible person looking for advancement with established firm. P-6165, Engineering News-Record.

University Career for Engineers—A number of teaching posts are open at a Canadian Engineering College in the fields of Civil, Electrical and Mechanical Engineering. The academic term extends from September 15th to May 1st and summer months are free for study, research or professional practice. Teaching loads run at 6 to 9 lectures and 3 to 9 laboratory hours, with a maximum of 15 hours per week. Salaries are open, depending on qualifications. Good pension and medical plans. Prime present requirements are in the fields of hydraulics and electronics but engineers in any of the three major fields are invited to inquire. P-6229, Engineering News-Record.

Prestressed concrete design engineer. Excellent opportunity to advance with new plant being built by large company initially starting in this field. Permanent position with company benefits. Send qualifications and starting salary desired to: P-6357, Engineering News-Record.

Engineers for municipal and industrial water supply, sewerage and treatment projects. Opportunities for permanent connection with long established firm of consulting engineers in mid-west. Both E.I.T.'s and engineers considered. Full information and reference in first letter requested. P-5889, Engineering News-Record.

Heavy contractor, N. Y. State, needs man to assume charge of take off, purchasing, engineering, expediting. Requires sound background & responsible field experience in heavier water, sewer & treatment plant work. Excellent opportunity for qualified person seeking & able to advance. Reply to P. O. Box 147, Colvin Station, Syracuse, N. Y.

Wanted Sales Engineer Expanding 55 year old manufacturer of metal building products, including deck, wall and floor panels, windows and doors, seeks sales-minded engineers or equivalent experience in the construction field. Man selected will be trained and sent out to do field promotional work with architects and engineers before assignment to a regional sales office. Send resume to: Personnel Director, Fenestra Inc., 2250 East Grand Blvd., Detroit 11, Michigan.

WANTED
EXPERIENCED ESTIMATOR
by Foundation Contractor

Must be familiar with take-off and pricing of Underpinning, Piles, Concrete, Excavation. Send resume of experience.

P-6422, Engineering News-Record
Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

CIVIL ENGINEERS

Civil Engineers with experience in hydraulics, concrete, soils or specifications for design hydraulic structures in Harrisburg, Pennsylvania. Graduate Civil Engineers also required for Chief, Construction Branch and Resident Engineers on Dam Construction. Salary open. State experience, salary requirements and references.

P-6428, Engineering News-Record
Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

POSITIONS VACANT

Splendid opportunity for 2 Young Engineers —Foundation Contractor has opening in New York and also in New England area. Some field experience desirable. Send resume including references, availability and salary wanted to: P-6399, Engineering News-Record.

Superintendent, Building Construction. Highly capable superintendent wanted for company operating in eastern part of West Virginia, Maryland, Southern Pennsylvania and Northern Virginia. Furnish details as to experience, references, education and when available. P-6400, Engineering News-Record.

Nationally known southern engineering firm, has opening potential for Chief Engineer. Graduate Engineer, age 45-55, experienced in engineering organization and administration, with thorough knowledge and experience in industrial, commercial and institutional design and construction work. Give detailed historical and professional records, availability and salary requirements. All inquiries confidential. P-6067, Engineering News-Record.

Sales Manager with customer following for N. J. Industrial Builder (N. Y., Pa.) Reply details, salary, DuVal Construction, 54 Rt. 17, Paramus, N. J.

Wanted by expanding southern structural steel fabricator, experienced structural draftsman to assume duties of squad supervisor. State age, experience, education and salary requirement. Forward full information to P-6437, Engineering News-Record.

Resident Engineer—for inspection and supervision of construction of sewage treatment plant and intercepting sanitary sewers, for out-of-town assignment in southeastern New York State. Salary open. Address reply with resume to: O'Brien & Gere, Consulting Engineers, 400 East Genesee St., Syracuse 2, New York.

Wanted: Civil Engineer to assist Chief Engineer in designing and estimating and overseeing of building construction, mostly industrial. Northeast Constructors, Inc., 8 Church Street, Gouverneur, New York. Contact John W. Rouse, President.

Surveyor or engineer with road construction experience and drafting ability. Reply to The Collier Company, c/o W. H. Turner, Everglades, Florida.

Wanted Experienced Estimator by foundation contractor. Must be familiar with take off, pricing & underpinning, piles, concrete & excavation. Send resume of experience to: P-6455, Engineering News-Record.

POSITIONS WANTED

Civil Eng. 31, married, B.S., M.S. in structures. 6 years experience in construction and estimating. Recent graduate of accredited law school. Top fourth of class. Will consider any opportunity. PW-6117, Engineering News-Record.

BSCE EIT 23 eighteen months experience on inspection and administration of construction contracts for the Navy. Varied construction experience while attending college. Seeks start with general contractor in Chicago area. Available 15 November 1957. PW-6099, Engineering News-Record.

Construction Executive: 20 years sound experience, Engineering and Project Manager, Estimating, Supervision, Management. Industrial building construction and mechanical installations from customer contact to completion of projects. Desire permanent connection with expanding Utility on power plants or Engineering and Construction Firm. PW-6242, Engineering News-Record.

(Continued on opposite page)

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POSITIONS WANTED
Continued from opposite page

Civ. Eng.; BCE, PE., 10 yrs. experience heavy construction. Chf. estimator roads, bridges, paving, sewerac, gas & water lines, all types excavation. Bids, subs, costs, administration. N. Y., N. J., Conn. only. PW-6047, Engineering News-Record.

Civil Engineer, 32, BS, MS (Structural), Registered, 8 years varied domestic and foreign experience in teaching and in design, construction and maintenance of highways, railroads, bridges, chemical and petroleum process plants. Desires permanent position in Southern U. S. PW-6322, Engineering News-Record.

Superintendent Const. 20 years experience, Institutional, commercial, industrial projects. Engineer. PW-6329, Engineering News-Record.

Young Executive C.E. 10 years experience pile driving, dredging heavy foundations, bulk head, and brick water const., desires position with positive future in progressive engineering or construction co. PW-6348, Engineering News-Record.

Energetic Civil Engineer seeks supervisory position, minimum $12,000 yearly. Broad experience as owner's and contractor's engineer includes road and railroad location, very large topographical surveys, highway construction, docks, pulpmills, steam plants, large airbases and defense projects up to $60,000,000. Presently completing assignment as contractor's Project Engineer on large vehicular tunnel. PW-6361, Engineering News-Record.

Civil Engineer—B.S.C.E. Age 34, Registered. Experienced—Municipal, Sewers and Sewage treatment, Industrial. Desire to relocate Southeastern Coastal Area. PW-6383, Engineering News-Record.

Carpenter Superintendent—33 married. 11 years experience on bridges, buildings, and tunnels. 1 year Engineering background. Available immediately, will travel anywhere in States. References on request. PW-6392, Engineering News-Record.

Construction Supt. General construction. PW-6317, Engineering News-Record.

Sanitary Engineer, MCE Cornell, 19 years experience, 12 years in responsible charge, research & development, reports & planning, design, construction, operation of water & waste treatment facilities. PW-6444, Engineering News-Record.

General or Field Superintendent, age 44 years. Over 25 years experience in Multiple Story Concrete and Steel buildings, housing projects, chemical processing plants, oil refineries, pre-cast concrete buildings, and ordnance plants consisting of buildings, roads, railroads, and utilities. Complete resume and references upon request. Available November 1. Will consider foreign location. PW-6398, Engineering News-Record.

Structural Engineer, registered graduate, 30 years subways, waterfronts, buildings, foundations, chemicals and power plants, etc., available for responsible position. PW-6405, Engineering News-Record.

Registered Architectural Engineer, specializing structural design all types of buildings, with Architects 9 years, Industry 6 years, Consultant 5 years. Experienced designer, checker, supervisor. Desires permanent position with advancement possibilities. PW-6412, Engineering News-Record.

CONSTRUCTION MANAGER

30 years experience in all phases of industrial and heavy construction. Proven ability in complete handling of company multi-project operations, promotional selling and developing of prospects. Reply:

PW-6343, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

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Reinforced concrete and industrial building. Age 55. Has good following of key men in all trades. Will travel. Preferably midwest or western states.

PW-6380, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

POSITIONS WANTED

Canadian P. Eng., M. Sc.—15 years experience in structural design, bridges, buildings, hydro-electric, seeks permanent position in supervisory capacity, preferably Seattle, San Francisco. Wide experience in prestressed conc. design & constr., familiar with precast production. PW-6397, Engineering News-Record.

Reg. P. E., married, BCE, MSCE, grad work in hydro, struct, and geol. Varried experience in construction, design, inspection and client relations. Desires work with consultant, with opportunities, will consider others. PW-6416, Engineering News-Record.

Chief Electrical Engineer—P. E.—Completing foreign contract—Available soon—Wide experience design & construction power plants, air bases, industrials, refineries, POL & AE—Multilingual—Foreign only on single or family status. PW-6417, Engineering News-Record.

Supt., Project Mgr. Combination available immediately for all types of construction. Experienced, Florida & West Indies. P. O. Box 3771, Sarasota, Fla. RI. 79843.

Construction Executive: Age 41. Nineteen years experience. All phases industrial, commercial, and institutional construction. Bids to completion, contract negotiation, supervision, job cost accounting and financing analysis. Desire permanent connection with young, growing, well financed organization with possible future participation. Minimum $15,000. Available November 1957. References. PW-6440, Engineering News-Record.

Struct. Design, 20 yrs. exp., wish overseas job. Will also accept field job. PW-6446, Engineering News-Record.

Electrical Engineer: Over thirty years experience covering all phases of electrical and mechanical construction and operation. Design certain fields. Married, no children, excellent health, free to travel. Employed. Available December 1. PW-6425, Engineering News-Record.

Project Manager or Superintendent, 29 years ex., no fancy education but have and can handle large road and airfield jobs preferable earth. Can supply a good line or followers. Available now. PW-6427, Engineering News-Record.

General Supt. or Project Manager 25 yrs. experience: Industrial, commercial and Institutional construction. PW-6430, Engineering News-Record.

Engineer—BSCE deg. with 4 yrs responsible experience in the construction of chemical plants, oil refineries and nuclear power plants, desires position in sales or service engineering. Mid-Atlantic states preferred. PW-6429, Engineering News-Record.

Plant Cons't Sup't, Engineering background new plant or additions, all type buildings. Can prepare plans, etc. for additions, sewage, water supply, site planning, maintenance, 30 yrs experience. Desire permanent connection Florida. PW-6452, Engineering News-Record.

Struct. engineer, BS in CE, RPE, age 36, experienced in design and coordination of school, industrial and institutional buildings. Background in sanitary and municipal work. Desire to associate with small to medium-sized consultant or architect with possible future partnership. Present income over $8500. PW-6458, Engineering News-Record.

Danish building Engineer, 30, bricklayer, letters of Apprenticeship, engineer experienced in design, construction, and detailing for Reinforced concrete, 3 years superintendent. PW-6459, Engineering News-Record.

Opportunity and interesting work wanted. CE, EIT, 25, 3 yrs varied experience. Interested in Planning, Sales or Process Industry. Prefer NY, NJ, Conn. PW-6460, Engineering News-Record.

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Responsible for reviewing, designing, and estimating cost on all electrical engineering phases of engineering work; reviewing and analyzing parts requirements; analyzing all operations activities involving electrical engineering; reviewing and recommendation on all requisitions and work orders involving electrical equipment, including conveyor systems, railroad rolling stock, power plants, mining and related equipment.

Must be graduate electrical engineer, with minimum of 10 years' experience in above responsibilities.

Assistant Superintendent Mechanical—Ore Handling

To direct and co-ordinate the mechanical maintenance of ore-handling system, including crushers, car dumper, ore bridge, rotary plows and shiploader.

Must be graduate mechanical engineer with 5 to 8 years' experience in operation and maintenance of crushers, pan feeders, speed reducers, hoists, idlers and rollers; must have a knowledge of vulcanization of belts, belt splices, welding, and machine shop repair.

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P-6423, Engineering News-Record
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Civil-hydraulic background on planning, designing of water-sewerage treatment plants, distr. systems, pump stations.

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Civil, qualified in dam design, investigate rock structures, key-ways. Evaluate dam locations and type of dams.

Soils Laboratory

Experienced in laboratory procedures and techniques in problems of soils, concrete, etc. Hydraulic model testing desirable.

Ground Water Hydrologist

Civil, qualified with good knowledge of hydraulics experience in ground water projects, small municipal water and sewerage systems. Know specifications, estimates and select equipment.

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Education and Experience Requirements: B.S. in Civil or Sanitary Engineering and five (5) years experience in above special fields—or—the equivalent combination of related education and experience in lieu of a degree.

Additional data will be sent to all applicants.

Send complete summary of your education and experience to: Mr. C. F. Wertz, Director, Dept. of Water and Sewers, P. O. Box 318, Miami 33, Florida.

PLANNERS

Community Planner IV. New. $7,170-$8,550 (excluding longevity salary increases). Education equivalent to graduation from a university planning program with the equivalent of at least 5 years' experience in planning work. Considerable experience in dealing with public groups essential. Direct the Master Plan Program for this city and its extraterritorial area.

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Personnel Department
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HIGHWAY AND STRUCTURAL ENGINEERS - DESIGNERS - DRAFTSMEN

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Write outlining background and experience. Please include telephone number.

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State Office Building
Madison 2, Wisconsin

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ENGINEERING GROUPS ACROSS THE COUNTRY are finding in increasing numbers the advantages of owning a home of their own. A current rash of planning and building of engineering centers has been caused by growth in memberships, staffs, libraries and activities—growth that has made the hired hall wholly inadequate for organizations of engineers in many metropolitan areas. And at the national level, plans for a new Engineering Societies Building were advanced with recent announcement (ENR Oct. 3, p. 17) that a fund-raising campaign soon would begin among business and industry.

While desirability of an adequate engineering headquarters in every major city—as well as for the nation as a whole—may be perfectly obvious, it is seldom, if ever, very obvious where the funds for such facilities are to be found. Necessary financing is always a problem. Sometimes, but unfortunately not often, a single, generous donor can be found to finance the entire project. More often, funds must be raised among the engineers themselves, among the individual society members who are to profit from advantages of the desired new engineering headquarters. That such individual financial contributions are invariably necessary is not always made fully clear.

It is simple to think wishfully that philanthropic corporate interests will come through to solve the local and national engineering headquarters problem. It is equally easy to assume that George, some individual of greater personal means, will do it. Yet, there is no denying the logic of spreading the obligation thinly over all who have interest in the facility to be financed. Many fine cathedrals have been built with the pennies of the poor. Many fine facilities for engineering groups will replace inadequate hired halls now in use, if each individual engineer to be benefited will recognize an obligation to do his fair share when called upon.

What Is a Rockfill Dam?

RECENT LETTERS FROM READERS have avowed that the 425 ft high Mud Mountain Dam and the 430 ft high Ambuklao Dam are records for high rockfill dams as compared with records claimed for Brownlee (395 ft) and Mihoro (396 ft) Dams. The Brownlee and Mihoro records are based on listing as rockfills only those dams with face membranes (like Wishon Dam, ENR Aug. 29, p. 38) or with sloping impervious cores (like Brownlee, ENR Feb. 7, p. 46). Thus, the matter of record height for rockfill dams depends on definition.

Obviously, a rock mass with a face membrane of concrete or like material is a rockfill dam. When the face membrane is replaced by a sloping core, there can be little doubt that this, too, is a rockfill dam, the main rock mass is placed in the same manner as rock in a membrane-faced dam. And in many instances the inclined core is just thick enough to provide the minimum desirable percolation. Going one step further, there is not much difference between an inclined core and a thin vertical core—although this is a point where arguments start. And it is a major point of difference between Brownlee and Ambuklao, for instance. But, perhaps it should be conceded that this type structure is a rockfill dam. By this reasoning, Mud Mountain and Ambuklao would be the two highest existing rockfills and not Mihoro and Brownlee.

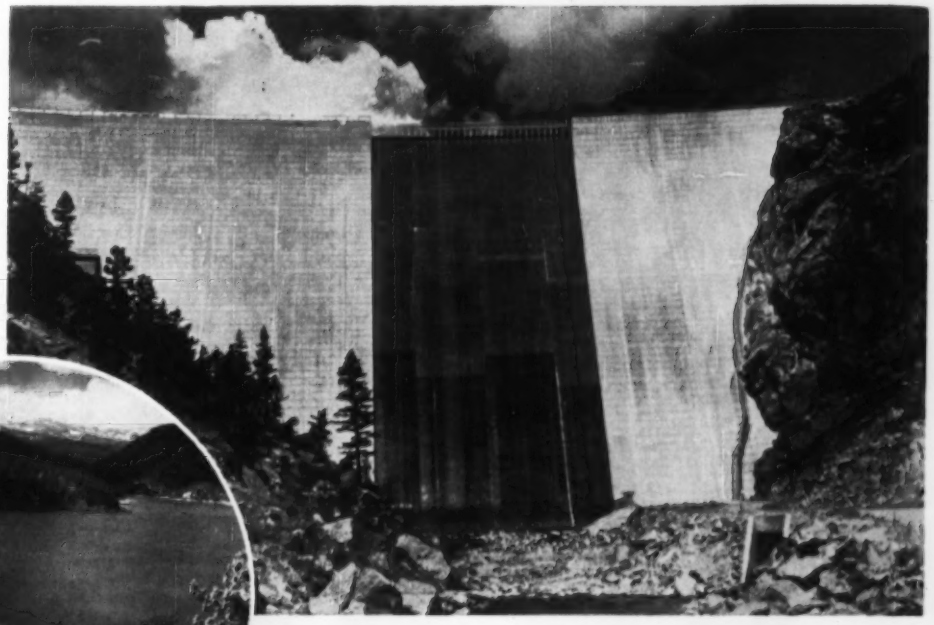
There are instances where rockfill shells are used with thick impervious cores. This would be the case where the core material is cheaper to develop and place than the rock shell, as for example at Cherry Valley Dam (ENR Aug. 26, 1954, p. 30). Here it truly becomes difficult to draw the line between earthfill and rockfill dams.

But a true rockfill has relatively steep side slopes as compared with a true earthfill—something like two horizontal to one vertical as a minimum rockfill slope as compared with a maximum of about three to one for earthfills. So a limiting definition of a rockfill dam could well be one that contains at least 50% rock and has side slopes of two to one or steeper.

End of Delays at Niagara?

IT NOW IS APPARENT that the real reason why the City of Niagara Falls is objecting to the plans of the Power Authority of the State of New York for developing the unused water on the New York side at the Falls is because the city wants to be compensated for the tax loss it will incur as a result of the new development program. The city's criticism of the engineering details of the proposed work is just a delaying tactic to force a bigger concession from the Power Authority than the authority is willing to make. Serious as the interveners may be in their favoring of a power tunnel rather than open and cut-and-cover channels, it is inconceivable that the added cost (variously estimated at $55 million and $105 million) is justified. Thus, the only real argument opponents appear to have is the tax loss, due mostly to the replacement of Niagara Mohawk's destroyed Schoellkopf plant with a plant of the Power Authority, a tax-exempt agency.

In view of this situation, the outcome of the hearings before the Federal Power Commission should be favorable to the Power Authority. The authority's engineering plans were prepared by capable engineers. The issue of compensation to be paid the City of Niagara Falls, presumably, is beyond the jurisdiction of FPC. It is rather a matter between the city and the State of New York. If FPC approves the Power Authority's engineering plans following the current hearings, the way will be cleared for an immediate start of work even though the city may not be satisfied with the outcome.



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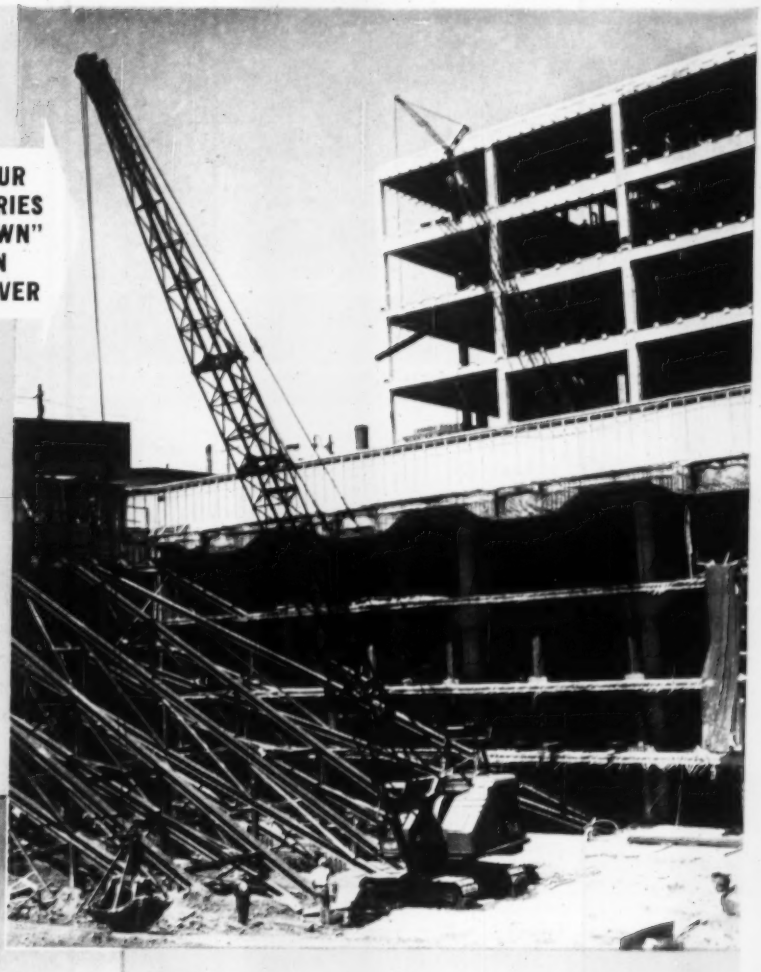

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